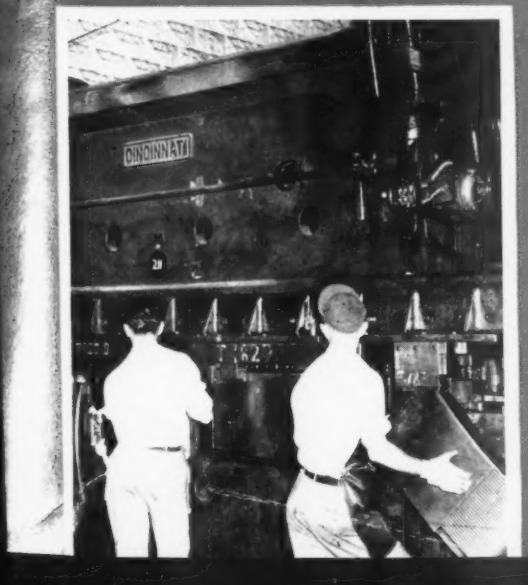
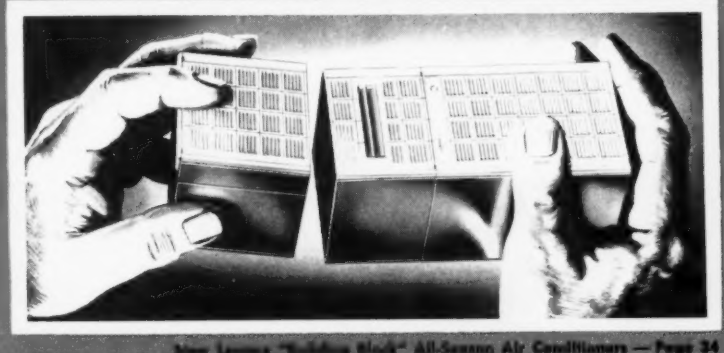
APRIL • 1959

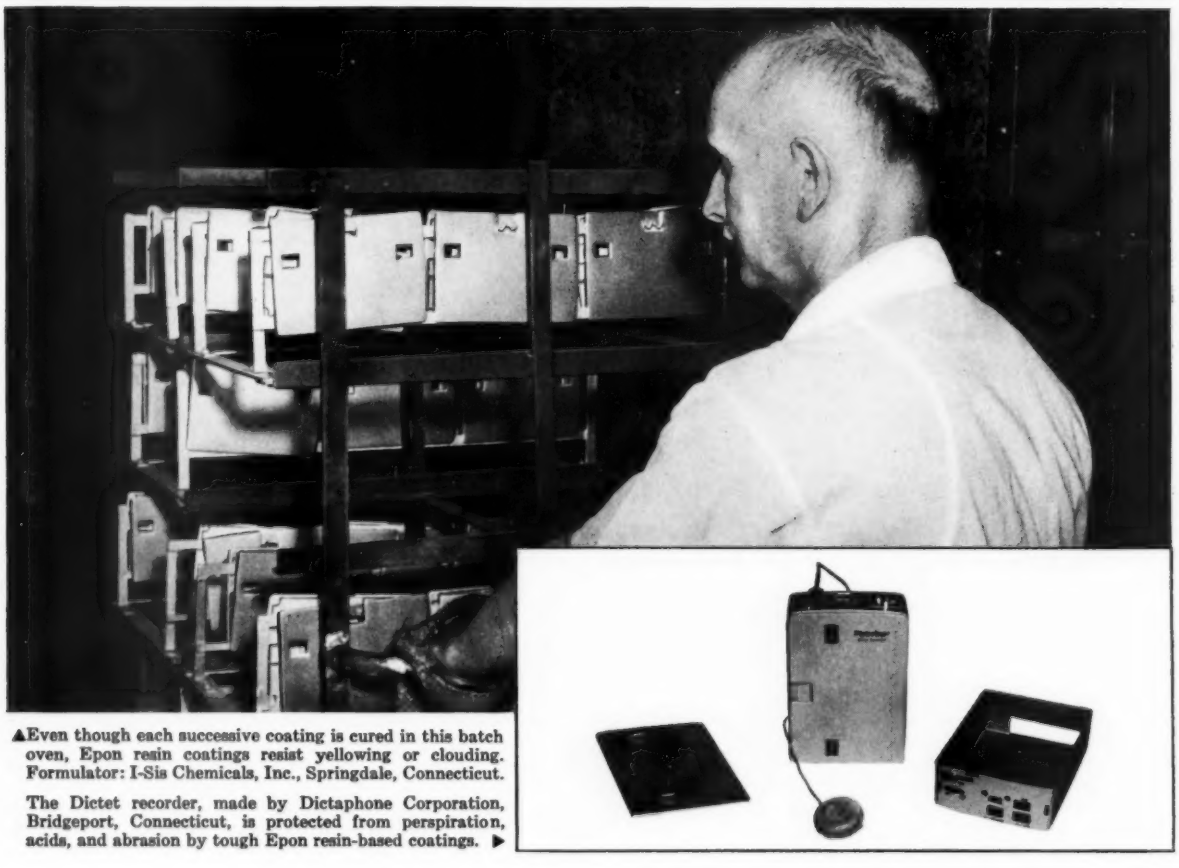
MPM Metal Products Manufacturing

Serving the Appliance and Fabricated Metal Products Industry





At Dictaphone Corporation:



▲Even though each successive coating is cured in this batch oven, Epon resin coatings resist yellowing or clouding. Formulator: I-Sis Chemicals, Inc., Springdale, Connecticut.

The Dictet recorder, made by Dictaphone Corporation, Bridgeport, Connecticut, is protected from perspiration, acids, and abrasion by tough Epon resin-based coatings. ▶

With Epon® resin-based coatings, Dictet recorders keep their "factory-fresh" look for years

Dictaphone's Dictet recorders are world-famed for their mechanical dependability. But exterior finishes sometimes failed to resist perspiration acids, abrasion, and impact.

Dictaphone turned to Epon resin-based formulations for their answer . . .

A three-coating system based on Epon resins—primer, aluminum, and clear—was thoroughly checked before being placed on the production line. Result: the clear, marble-like coatings had exceptional hardness which seemed to increase with aging . . . "the closest we can come to a nickel or chrome plating," reported paint technicians.

Have you a coating problem? An Epon resin-based formulation may be *your* answer, too. Its outstanding abrasion and chemical resistance make it an ideal all-purpose industrial coating.

Call on Shell Chemical sales offices for names of suppliers. And write for the full Epon resin coatings story, "Planning to Paint a Pyramid?" SHELL CHEMICAL CORPORATION, 50 West 50th Street, New York 20, New York.

SHELL CHEMICAL CORPORATION
PLASTICS AND RESINS DIVISION
CHICAGO • CLEVELAND • LOS ANGELES • NEW YORK
IN CANADA Chemical Division, Shell Oil Company of Canada, Limited, Montreal • Toronto • Vancouver

SHELL

New steels are born at Armco

Only Armco Cold-Rolled Steel Specified
For Deep-Drawn G. E. Cleaner Casing

General Electric consistently specifies sheet coils of .032", Armco Cold-Rolled Drawing Quality Special Killed Steel for the deep-drawn top half of the casing on canister-type vacuum cleaner models. These units are produced at G.E.'s Vacuum Cleaner Department, Housewares and Radio Receiver Division, Cleveland, Ohio.

The top half of the casing on every General Electric canister-type vacuum cleaner is fabricated from Armco Cold-Rolled Steel. Here's why, in the words of G.E.'s steel buyer:

"Armco Cold-Rolled performance has proved through trial to be superior through a lower percentage of surface defects plus excellent drawing quality."

Despite the severe draw, rejects are extremely low because of the consistently excellent drawing quality of Armco Cold-Rolled Steel. Superior surface and uniform grain structure assure uniform finishing operations.

Special Steels for every need

Cold-rolled is only one of a wide range of Armco Special Steels processed to meet specific product needs. An Armco representative will be happy to consult with you about selection of Armco Steels for your requirements. Just call your nearby Armco Sales Office or write us. Armco Steel Corporation, 1649 Curtis Street, Middletown, Ohio.

ARMCO STEEL

Armco Division • Sheffield Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation • Southwest Steel Products

HOW APOLLO GLAMOR METALS
Open New Channels to Profit and Sales

New Channels to Profit . . . . . .

1. **APOLLO glamor metals arrive at your plant ready for immediate fabrication**—beautifully pre-finished, pre-plated or pre-polished to your specifications.
2. **Just form, package and ship**—your product goes to market with an absolute minimum of work, worry and time.
3. **Your investment is minimum**—only the material and any standard shop cutting or forming equipment are required.
4. **Extras are eliminated**—the excellent, uniform quality of APOLLO Pre-Finished Metals puts an end to costly piece plating, finishing or polishing within your own shop.
5. **No waste, no unnecessary stocking**—you can plan your production, order the exact quantity you require . . . sheets, strips or coils . . . and get delivery timed to your schedule.
6. **Expert assistance**—APOLLO'S factory-trained staff will work with you from the design stage to finished product . . . just ask for help.

New Channels to Sales . . . . . .

1. **In the home**—relaxed living is taking over and so is metal. APOLLO Metals are abreast of the trend with a full range of finishes and forms ideal for kitchen accessories and appliances • living, dining and family room furniture trim • lighting fixtures, lamps and lamp shades • attractive, unbreakable decorator items from wall plaques and picture frames to trays and planters • every conceivable home item where metal makes living easier.
2. **Commercial and business**—the horizon is unlimited, so are APOLLO Pre-Finished Metals. Pick your market: counter trim, restaurant accessories and appliances • automatic vending equipment • advertising displays that sparkle as only metal can • novelties • low cost, attractive gift items • salesmen's pass-ons • metals that meet commercial and business needs for quality, prestige and economy.

Call an APOLLO representative and tell him you want more facts about new channels to profit and sales...or get information direct from our factory

Apollo METAL WORKS

6684 S. OAK PARK AVE.
CHICAGO 38, ILLINOIS

Factories in Chicago, Ill., and Bethlehem, Pa. • • • Nationwide Representation

MPM

(including finish)

MONTHLY TRADE PUBLICATION

Established January 1944

Published by

DANA CHASE PUBLICATIONS

York Street at Park Avenue, Elmhurst, Illinois
Telephones • TErrace 4-5280 • TErrace 4-5281

NBP BPA

APRIL • 1959

VOL. 16 • NO. 4

FEATURES

SAFE TRANSIT SECTION

SHORT FEATURES

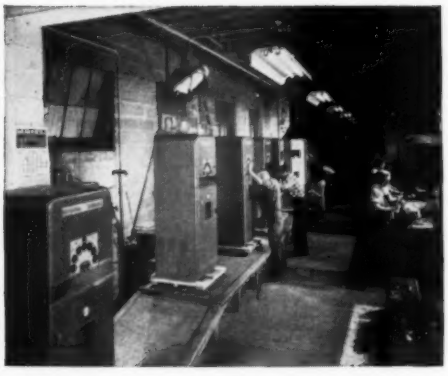
DEPARTMENTS

METAL PRODUCTS MANUFACTURING

FROM RAW METAL TO FINISHED PRODUCT

A trade publication devoted to the interests of the metal products manufacturing industry with special editorial attention to home appliances. The editorial scope covers design, engineering, market and statistical information and technical and practical information on plant facilities and all phases of manufacturing "from raw metal to finished product." Free controlled circulation to top management, purchasing, engineering and key plant management and supervision in metal product manufacturing plants. To others, subscription price is $8.00 per year, domestic. To all other countries $10.00 per year (U.S. funds). Single copies, $1.00.

Accepted under the act of June 5, 1934 at Aurora, Illinois authorized January 7, 1948.



Maysteel Products' *final assembly line for drink machines fabricated from Youngstown Cold-Rolled Sheets. Sub-assemblies of all components—including electrical systems—flow into this line.*

Accent on Excellence

Youngstown cold-rolled sheets

Unique among sheet metal fabricators, Maysteel Products Inc. of Mayville, Wisconsin handles jobs—such as this modern, up-to-the-minute drink machine—from rough idea through to finished product as a contract manufacturer.

Their designers, engineers and sheet metal craftsmen team up modern facilities and advanced tooling techniques with the best drawing steel obtainable. Youngstown Cold-Rolled Sheets are specified because their flatness and gage uniformity help Maysteel maintain desired quality standards.

Wherever steel becomes a part of things *you* make, the high standards of Youngstown *quality*, the personal touch in Youngstown *service* will help you create products with an "accent on excellence".

THE
YOUNGSTOWN
SHEET AND TUBE COMPANY *Youngstown, Ohio*

Manufacturers of Carbon, Alloy and Yoloy Steel

DURACRON

Cut finishing costs on refrigerators... with no sacrifice in quality

Why continue with multiple coats when One-coat DURACRON is as good or better for refrigerators? With this amazing thermo-setting acrylic enamel, you'll cut finishing costs substantially—at no sacrifice in quality. DURACRON can be applied at higher line speeds. Its fast set reduces the number of rejects caused by dirt, sags and runs. Its unusual hardness and toughness greatly lessen danger of marring or abrasion in assembly.

• **One-coat DURACRON** actually upgrades performance in service, too. Its color retention, hardness and resistance to the corrosive effects of stains, grease, detergents and other chemicals are superior to conventional two-coat finishes.

MAIL THIS COUPON TODAY!

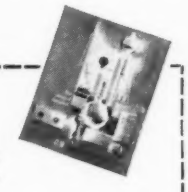
• Write for free brochure which explains in detail how DURACRON One-coat Enamel cuts finishing costs without sacrificing quality.

PITTSBURGH INDUSTRIAL FINISHES

PAINTS • GLASS • CHEMICALS • BRUSHES • PLASTICS • FIBER GLASS

PITTSBURGH PLATE GLASS COMPANY

IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED



Pittsburgh Plate Glass Company,
Industrial Finishes Division,
1 Gateway Center, Pittsburgh, Pa.

Gentlemen: Please send me a copy of your free book on new DURACRON Acrylic Enamel.

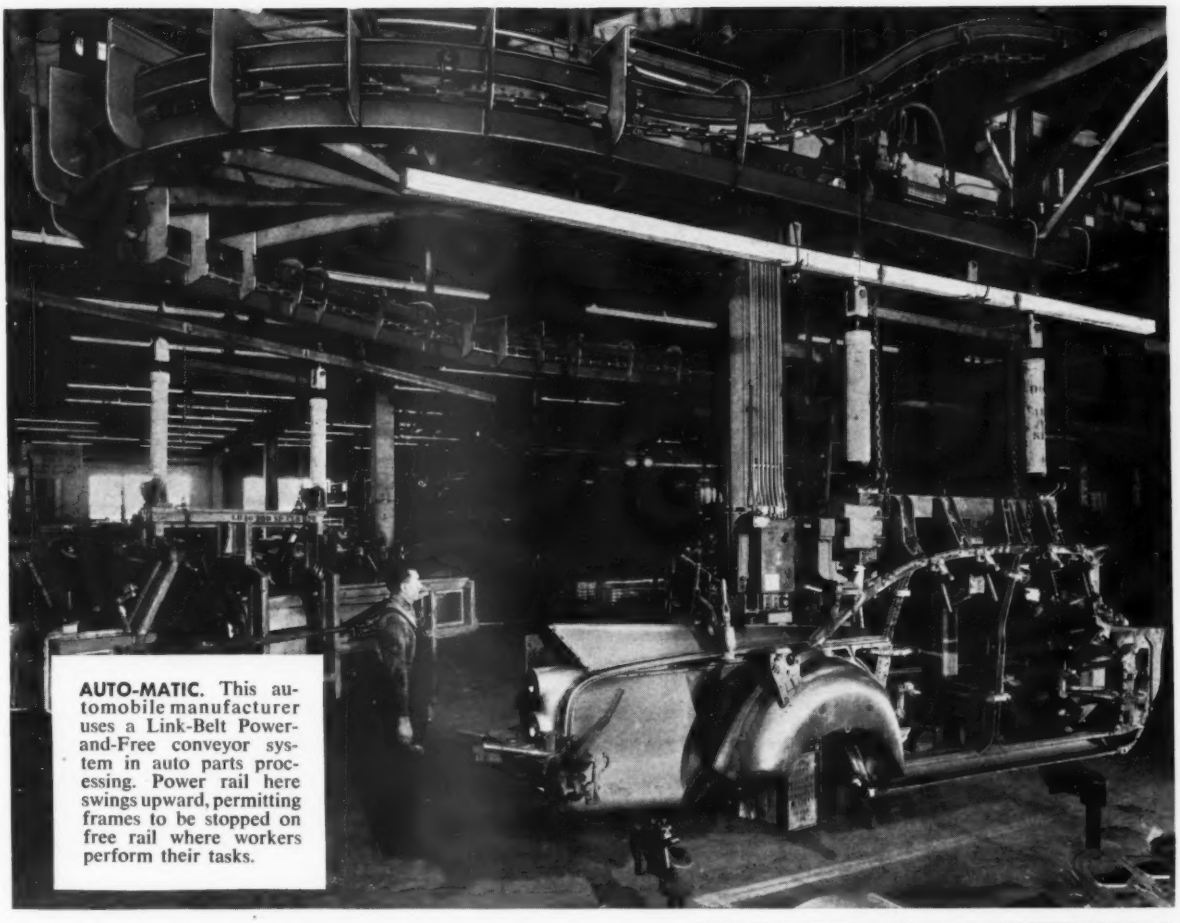
Name_____

Address_____

City_____ **County**_____ **State**_____

Name of Company_____

Stop-and-go handling for non-stop production



AUTO-MATIC. This automobile manufacturer uses a Link-Belt Power-and-Free conveyor system in auto parts processing. Power rail here swings upward, permitting frames to be stopped on free rail where workers perform their tasks.

Link-Belt Power-and-Free conveyors provide routing, storage, recirculation

MATERIALS handling flexibility to its highest degree! Link-Belt Power-and-Free trolley conveyors make straight-line production possible even where materials are processed at varying speeds. They'll transport parts to work areas, leave them there to be processed. They'll reclaim material from storage as needed. Cargo can be slowed down, speeded up or stopped . . . moved vertically, pivoted, indexed, dumped or dipped as needs dictate.

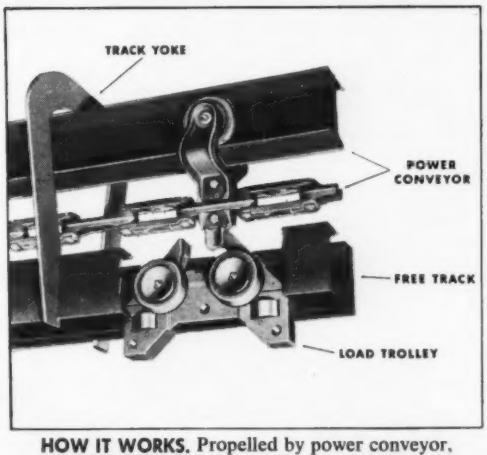
To learn more, call your nearest Link-Belt office or write for Book 2330.

15,116

LINK-BELT

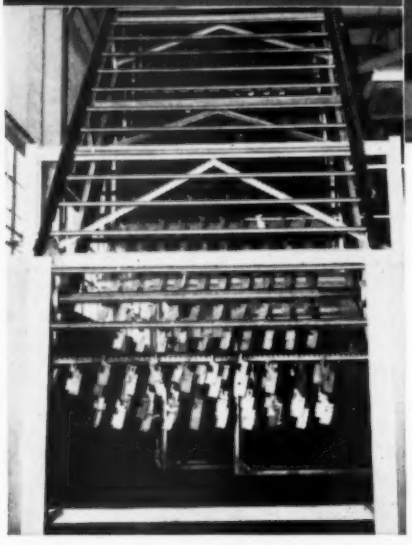
TROLLEY CONVEYORS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World.



HOW IT WORKS. Propelled by power conveyor, material rides smoothly on free track below. At work station or storage area, load carriers are switched to or from unpowered free tracks which can be located on either or both sides of the main Power-and-Free conveyor.

FINISHING SYSTEMS...



The 8 Ft. wide Crossbar Conveyor carries a variety of products and a great mass of small parts through all processing units of the Dip Coating System. The Crossbars in the Conveyor are designed for a work load of 250 lbs.

Complete Mahon Installation Provides Compact Facilities for DIP COATING and SPRAY PAINTING in CUTLER-HAMMER'S Lincoln, Illinois Plant!

In this unique finishing system, the greater part of which is located on the roof, Mahon engineers have employed what is probably the longest continuous crossbar conveyor ever designed into equipment of this type.

The painting enclosure shown above is inside the large electrical plant. This enclosure is divided into two sections, one of which has a paint mixing room on the ground floor and paint Dip Tanks on a mezzanine floor above. The other section houses two Spray Booths and a Batch-Type Finish Baking Oven. The conveyorized, Five-Stage Metal Cleaning and Rust Proofing Machine, Dry-Off Oven, Finish Baking Oven and the Filtered Air Supply Equipment are housed in one enclosure on the roof.

This is the third complete finishing system installed by Mahon in Cutler-Hammer Plants across the country.

If you have a finishing problem, or are contemplating new finishing equipment, you, too, will want to discuss methods, equipment requirements and possible production layouts with Mahon engineers . . . you'll find them better qualified to advise you, and better qualified to do the initial planning and engineering which is so important in specially designed equipment of this type.

See Sweet's Plant Engineering File for Information, or Write for Catalogue A-659

THE R. C. MAHON COMPANY • Detroit 34, Michigan

SALES-ENGINEERING OFFICES in DETROIT, NEW YORK and CHICAGO

. . . . the EXPERIENCE that goes into the PLANNING and ENGINEERING of MAHON EQUIPMENT is the item of GREATEST VALUE to YOU!

MAHON

From manufacture to production line consumption, *speed* is the key word at Southern Screw. Large and small volume users of screws know they can rely on Southern Screws to do any fastening job fast, because Southern Screws are built for *speed*, with *speed*, and by specialists who know what *speed* means in the profit-and-loss columns.

If time-and-money-saving *speed* is the key word in your operation, be sure your next order goes to Southern Screw Company, Box 1360, Statesville, North Carolina. Write today for current Stock List.

IN FASTENERS SOUTHERN IS

SPEED

Machine Screws & Nuts • Tapping Screws

Wood Screws • Stove Bolts • Carriage Bolts

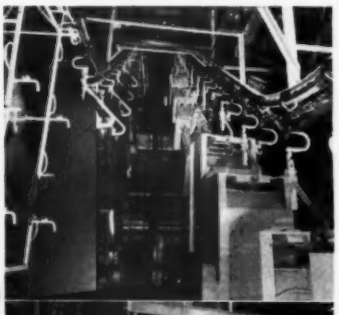
Dowel Screws • Hanger Bolts • Drive Screws

Manufacturing and Main Stock in Statesville, North Carolina

Warehouses: New York • Chicago • Dallas • Los Angeles

Southern SCREW COMPANY
STATESVILLE • NORTH CAROLINA

hundreds of refrigerators and freezers a day..... less than 2% rerun



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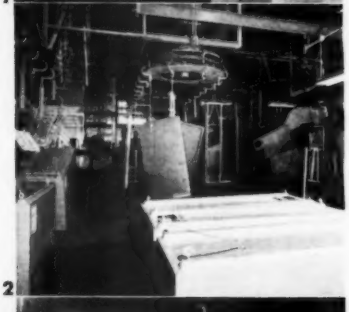

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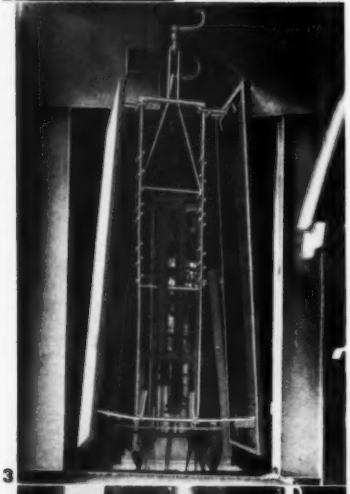

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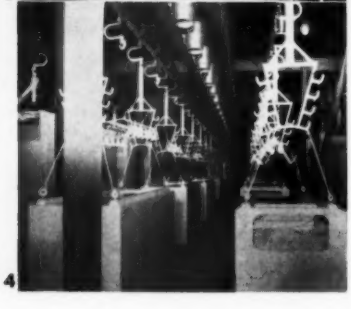


4

The story of a major appliance manufacturer's extraordinary Despatch Finishing Line

This system, completely designed and installed by Despatch, finishes hundreds of units a day with more than 98% accuracy. *Interiors* as well as exteriors! At 25 feet a minute!

Imagine this speed and accuracy in a system so big it is housed in a separate building designed by Despatch. So big it has 4,600 feet of conveyor. So big the air make-up system moves 220,000 C.F.M. and is heated by a 19 million B.T.U. gas fired line burner.

The reason? High efficiency engineering and some of the most modern heat processing components. You see just a few of them in these photos.

1. Unfinished units enter finishing building at left, through a Despatch-designed overhead tunnel. 2 hours, 24 minutes, 10 seconds later, finished units leave at right.
2. Units in center have left dry-off oven, following 6 stage washer where over-fired system heats water in just 40 minutes. Continuous sludge removal in Bonderite stage.
3. Flow Coater: 23 minute vapor chamber run. Recirculates paint; 100% filtration. Next stages: prime coat bake oven, 20 minute cooling run, pressurized tack-rag run and electrostatic painting.
4. In finish bake oven overhead nozzles force heated air against floor to circulate heat completely around and through units.

Another example of Despatch's leadership in the heat processing industry. When you have any heat processing problem, call on Despatch's unmatched experience—50 years and 50,000 installations.

DESPATCH OVEN CO.

DESPATCH OVEN COMPANY
619 S.E. 8th St.
Minneapolis 14, Minn., Dept. 402F

DESPATCH

Here's why we should see KERNS about Drawing Compounds

..."Kerns' engineers think in terms of our production. This was proven when we took advantage of Kerns' Memo Billing Trial Basis and let them supply sufficient material for a production test to prove the outstanding merits of the recommended Drawing Compound."...

We are certain these will be your words after discussing your drawing problems with a Kerns' technical service representative and ordering the recommended compound. Kerns has the most **complete line of Drawing Compounds** and, as manufacturing chemists and producers, are capable of providing **specialized compounds** to meet the requirements of any drawing operation.

Try it ... we supply material for production test ... no formal invoice rendered unless completely approved in production. Remember ... with Kerns **you get compounds tailored to your operation.**

Please send technical data sheets ☐
Have Technical Service representative call ☐

Name_____
Title_____
Company_____
Street_____
City_____ **Zone**_____
State_____

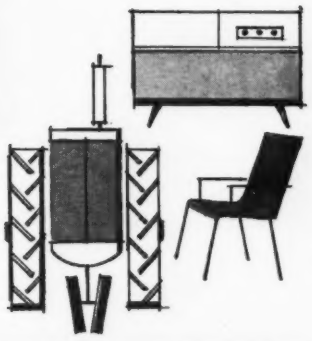
QUALITY SERVICE

L.R. Kerns Company

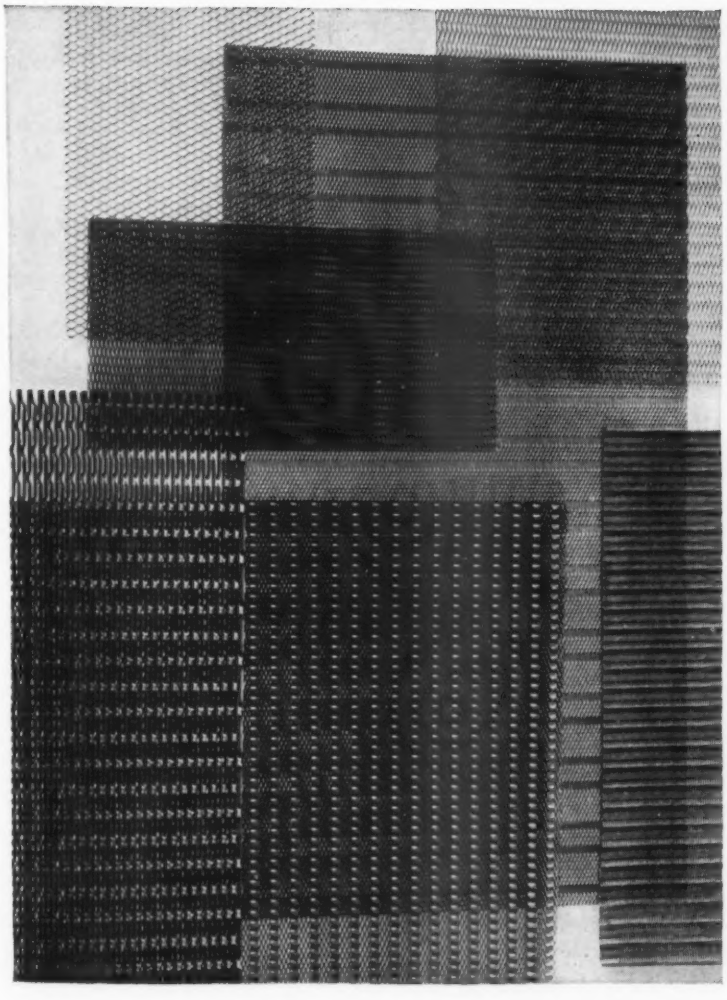
2659 EAST 95th STREET • CHICAGO 17, ILLINOIS

Subsidiary Plant **KERNS PACIFIC CORPORATION**
630 N. Batavia Street • Orange, California
Offices in principal cities throughout the U. S. A.

Inland "job-tailored" Cold Rolled Sheets work better



product: EXPANDED METAL



problem:

the production of expanded metal panels for a wide variety of products ranging from automobiles to air conditioners, tractors to phonographs, stoves to patio furniture, television receivers and lawn mowers. These to be fabricated from decorator designs in an almost limitless range of complexity. Equipment, created specifically for the purpose, functions at highest efficiency and economy with coil steel which is cut and expanded. The often enormous stretch of quite narrow strands could cause breakage and rejection of the entire piece.

solution:

the problem presented was overcome by "job-tailored" Inland Drawing Quality Aluminum-Killed Steel. The steel not only took punishment of severe expansion and pattern formation, but provided an excellent surface for all subsequent finishing operations.

INLAND STEEL

30 West Monroe Street, Chicago 3, Illinois

Sales Offices: Chicago • Davenport • Detroit • Houston • Indianapolis
Kansas City • Milwaukee • New York • St. Louis • St. Paul

INLAND

Cold Rolled Sheets

from the Editor's Mail

They fail to show up

Gentlemen: We are very interested in any information we may receive on all types of plastic tooling. We are now using some for jigs, but would like to know where we might receive an education on draw dies using epoxy resin.

We have talked to a number of companies represented at the various shows, but they fail to show up at our plant to work with us.

Like I say, we need an education in the use of this material. We will appreciate any and all information in plastic tooling.

Robert D. Aspelin, Methods Department
D. W. Onan & Sons, Inc.
Minneapolis, Minn.

More reprints on "enthusiasm"

Gentlemen: We would like to reprint the guest editorial appearing on page 17 of your February issue for distribution to our sales personnel. Will you please advise us of your permission to use this reprint for the above purpose.

Thank you for your cooperation.

Heinz O. Spier, Export Manager
Remington Corp., Auburn, N. Y.

Gentlemen: In the February issue of MPM there appears a most interesting guest editorial by Bennett Chapple.

Would you please advise me as to whether or not we may purchase 100 reprints of the above article. If reprints are not available, may we have permission to reprint here at Borroughs.

Will appreciate your answer to the above at your earliest convenience.

Paul V. Ernst, Purchasing Agent
Borroughs Mfg. Co.
Kalamazoo, Mich.

This is one of many requests received asking permission to reprint Mr. Chapple's editorial on enthusiasm in business and selling — "Chicken Feed and Metal Products."

The Editors

Norge article worked in nicely

Gentlemen: There has been much talk about the story on the combination washer-dryer in the March issue, and we appreciate the trouble the magazine went to to make this article look good. Would it be possible to get twelve additional copies of this issue? Of course, bill the writer for the cost of these.

You will be pleased to know that Harold Bull showed the magazine to distributors meeting in the Conrad Hilton

to Page 20 →

GUESTS LATE? ROAST RUINED?

Never Again!

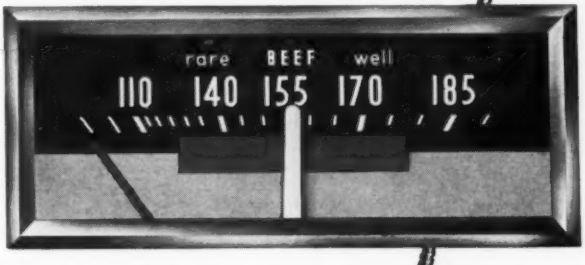
New

KING-SEELEY ROAST CONTROL*

Assures Perfect Roasts,
Keeps 'em that way

Now, the housewife can always serve a juicy, flavorful roast, oven-hot, done to a turn—*Regardless of how long dinner may have to be delayed.*

K-S ROAST CONTROL removes all uncertainty. She sets the control the way she wants the roast. K-S ROAST CONTROL takes over for her. She sets it, forgets it, serves it whenever she wants it.



HOW?

K-S ROAST CONTROL anticipates desired doneness—reduces oven heat to inside roast temperature and holds it there for as long as necessary till the roast is served—Hot, Juicy, Just Right.

The ability to hold a roast Perfect is NEW. Your customers will like it. Let's discuss its application to your new ranges.

**Newest member of the King-Seeley Chef-O-Matic family of dependable range controls.*

KING-SEELEY
CORPORATION

ANN ARBOR, MICHIGAN

8236

...Alodized with ALODINE!

Increased use of the five year aluminum license plate makes it vitally important that the metal retain its durability and wearing qualities under severe conditions of highway usage.

A number of forward looking states have already specified Amchem Alodine as the preferred prepaint treatment of aluminum license plate blanks. Amchem Alodine forms an amorphous coating on aluminum, insures its corrosion resistance and guarantees a tenacious bond for paint. It is simple to use, low in cost and highly efficient in its protective nature.

Whatever your metalworking problems, you can depend on Amchem Alodine and a host of associated chemicals and processes to facilitate production and provide you with a better product.

States now specifying Amchem Alodine for protective treatment of license plates, traffic signs, highway markers, etc.

DISTRICT OF COLUMBIA	NEW JERSEY
INDIANA	NEW YORK
KANSAS	PENNSYLVANIA
MISSISSIPPI	VIRGINIA
MISSOURI	WISCONSIN
NEBRASKA	MONTANA
NEW HAMPSHIRE	OREGON

Write for Bulletin 1424A describing specific applications of Amchem Alodine. Contains handy selection chart to help you choose the Alodine type suited to your needs.

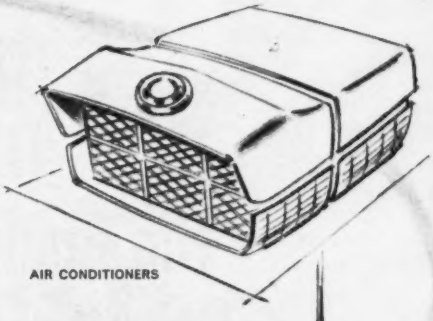
AMCHEM

ALODINE

Alodine is another chemical development of **Amchem Products, Inc.** (Formerly American Chemical Paint Co.) Detroit, Mich. • St. Joseph, Mo. • AMBLER 21 PA. • Niles, Calif. • Windsor, Ont. / Amchem and Alodine are registered trademarks of Amchem Products, Inc.

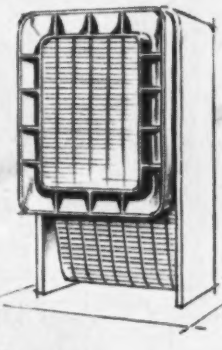
Idea! ... a world of inspiration with H&K perforated metals

TAPE RECORDERS

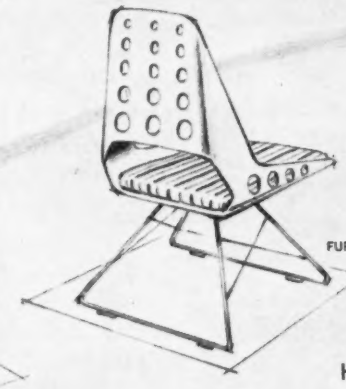


AIR CONDITIONERS

LIGHTING FIXTURES

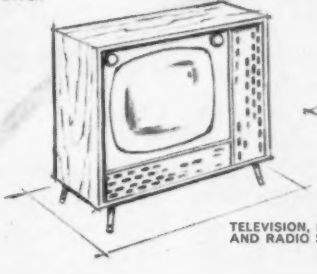


SPACE HEATERS



FURNITURE

Harrington & King can perforate the proper design, pattern and open area in practically any material available in coils, sheets or plates . . . from foil-thin to 1" thick.

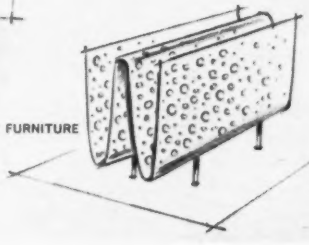


TELEVISION, HI-FI AND RADIO SETS

Metallic materials include steel, aluminum, stainless steel, brass, copper, monel, zinc, bronze, etc.

OFFICE FURNITURE AND EQUIPMENT

Non-Metallic materials include plastic, wood, composition, paper, cloth, etc.



NOVELTY FURNITURE

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☐ GENERAL CATALOG No. 75
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THE finish LINE

ONLY ON RARE OCCASIONS.... during our fifteen years of publication have the editorial pages of this magazine been used for a discussion of publication policies and editorial plans. On these few occasions the reader response has been most interesting and helpful to our editors. The purpose of this editorial is to further encourage comment, criticism, and editorial suggestion from MPM readers.

Frankly, we attach little importance to much of the "return card" type of publication surveys. Many are conducted in an honest attempt to get at the heart of reader habits and preferences, but without consideration of the many pitfalls of such survey work, which may result in inaccurate conclusions. All too often, too, a premise is established and a questionnaire designed to prove the premise, which can easily be done.

The kind of response that our editors *do* study carefully, and benefit from, is represented by personal letters from readers which tell what they do and *don't* like about our various editorial services and offer constructive suggestions. Each and every one of these communications is studied carefully with a view to constantly improving our service to readers.

The problem of editorial balance

When it was decided in 1949 to broaden the scope of this publication and offer "a complete editorial service" to the manufacturers of appliances and other fabricated metal products, a real problem of editorial planning was presented. It meant that there must be editorial material in *every issue* (not just occasionally) that would hold the interest of key personnel from top management and engineering to the operating man in the plant. This "editorial balance" is now a standard functioning part of MPM publishing policy and requires that the percentage of editorial content in relation to advertising must be higher than the average.

Editorial vs. commercial

MPM has a strict editorial policy of long standing which requires the divorcing of commercial considerations from feature editorial material. This strict policy calls for the elimination of all supplier (materials, equipment, components, etc.) company names or trade names from multi-page feature articles. This eliminates any semblance of catalog listing or "advertising" from feature material and confines it to a treatment of product design and plant operations that is considered primarily useful to our readers.

This policy sometimes comes as a surprise to new advertisers, but not only has it been well received by our manufacturer readers, but, once it is explained to the advertiser, he, too, will agree that it is in the best interests of raising the editorial plane. That is one reason why such a high percentage of MPM full length feature articles are "on the spot" staff reports including both editorial and photographic coverage. While supplier companies represent one of our best sources for editorial "leads" for plant features, they recognize that their assistance is for the purpose of serving our *readers* and not an individual supplier.

Guarding our readers

Another strict policy pertains to our thirteen thousand readers' privilege to decide what they shall receive by mail.

Any key man in management, engineering, purchasing, or plant operations in a plant producing an appliance or fabricated metal product is entitled to an MPM subscription, without cost to the individual or the company, upon written request including title or key function and company connection. To remain on the list, the reader is periodically required to return a circulation form for updating this information.

Our policy involves the *use* of these names. The circulation list is used for only two purposes: the monthly mailing of MPM and periodic use of specific parts of the list for editorial survey work. Never is the list rented or used, in whole or in part, for direct mail solicitation of our readers.

You can "put your oar in"

While our general editorial and publication policies have been well received by readers, we would be short sighted indeed if we failed to recognize the importance of continuous improvement of our editorial services.

As we read our favorite publications, we can all see chances for improvement, but how often do we do something about it? This editorial is an open invitation to *every* MPM reader to send a comment, criticism or suggestion which it is felt may result in improvement of our monthly service to readers. Send your letters to: Editor & Publisher, METAL PRODUCTS MANUFACTURING, York St. at Park Avenue, Elmhurst, Illinois.

Dana Chase

EDITOR AND PUBLISHER

Editor's mail

→ *from Page 14*

this morning. It worked in very nicely. In one hand he had a copy of the current issue of CONSUMER BULLETIN which praised the washer — in the other hand he held a copy of METAL PRODUCTS MANUFACTURING.

A. J. Tobin
Norge, Div. of Borg-Warner Corp.
Chicago, Ill.

Foam insulation

Gentlemen: Would you please send us three (3) reprints of the following article: "A production process for 'foamed in place' insulated cabinets." It ran in the February, 1959 issue Vol. 16, No. 2. Thank you very much for your prompt and courteous attention.

P. E. Pelletier, Director of Research
Pelron Corp., Lyons, Ill.

More on metal-foam-metal

Gentlemen: I would like twenty (20) copies of the article on pages 30-31, METAL PRODUCTS MANUFACTURING, February, 1959, Vol. 16, No. 2, "Westinghouse builds refrigerators of metal-foam-metal."

F. R. Marshall, Refrigerator-Freezer
Engineering Department
Westinghouse Electric Corp.
Columbus, Ohio

Bulletin board copies

Gentlemen: Many thanks for sending along extra copies of the February issue. I had seen the article, "Westinghouse builds cabinets of metal-foam-metal," and planned a letter to you before getting your note. Naturally, we are most appreciative and think you did an excellent job. For your information, we have had copies of the article posted on our cafeteria bulletin board since their arrival.

Joseph B. Smith, Manager, Public Relations
Electric Appliance Div.
Westinghouse Electric Corp.
Columbus, Ohio

Low temperature enameling

Gentlemen: As we have just received the requested copy of your magazine, October, 1956, we have noticed that this issue was second in a series of articles on low firing enamels.

Since we are very much interested in low temperature enameling on aluminum, aluminized steel, and even mild steel and stainless, we would appreciate receiving copies . . . . on this subject.

P. Graham Bell, President
P. Graham Bell Associates, Ltd.
Toronto, Ontario, Canada

to Page 24 →

the PRESSTITE GUIDE to Sealing Compounds for the REFRIGERATION INDUSTRY

the MOST COMPLETE LINE of Sealing and Caulking Compounds in America

Product	Uses	Characteristics
Wood Sealers	Treating porous boards to minimize absorption of moisture.	Black. In brush, dip or spray consistencies. Excellent water and water vapor resistance. Mild odor. Suitable for use under wide temperature range. Little or no shrinkage.
Sound Deadeners & Metal Coatings	Minimizing sound vibrations. Coating and sealing metal enclosures exposed to or immersed in water, as air conditioners, cooling towers, etc.	Black, brown and dark red. Little or no odor. All water resistant. Some acid, base, fire, heat and shock resist. Nil or slight shrinkage. Low thermal conductivity.
Rubber Cements	General purpose adhesion, as for adhering insulation or deadener pads. Especially good for fiberglass pads.	Excellent water resistance. Superior bonding properties. Service temp. range 0°F. to 175°F.
Elastic Compounds —Extrusions	Sealing seams on refrigerators, air conditioners, walk-ins, etc. Helps to keep out moisture or give an air seal where needed.	Tapes or round extrusions. Non-oxidizing. Excellent adhesion. Non-shrinking. Low heat and electrical conductivity. Will not affect most plastics, rubbers or lacquers.
Elastic Compounds —Grommets	Sealing areas where tubes and wire go through partitions, etc.	Available in grommets, special shapes. In black, green, aluminum-grey. High water resistance. Low thermal conductivity. Excellent adhesion. No shrinkage.
Cork Tapes	Wrapping and insulating cold refrigerant lines.	Excellent water resistance, adhesion, cohesion and insulation. Non-oxidizing, no unpleasant odor. Good flexibility.
Plastisols	Heat curing sealers for sealing outer cabinets of refrigerators and freezers, sealing spot-welded seams, providing smooth fillet on liners.	Little shrinkage. Good adhesion. Non-toxic. Low heat and electric conductivity. Non-oxidizing. Good resistance to water, acids, bases and oils.
Pumpable Mastic Sealers (White or Black)	Wherever a permanently soft mastic sealer is required, as for sealing breaker strips, fasteners, name plates.	Excellent water resistance, non-oxidizing, non-staining, non-corrosive. Little or no slump or flow at elevated temps., will not get brittle below freezing. Will not soften enamel, craze or etch most plastics. Non-shrinking.
Permagums (Brown or White)	Sealing seams of all kinds in refrigerating equipment.	In bulk or extrusions. Non-hardening. Mild odor, non-contaminating. Water resistant, good adhesion. Easily handled and molded. High cohesive strength. Will not swell most rubbers. Flexible at low temperatures.
Plastic Sealer Tapes	Sealing seams, especially under extreme temperature variations.	Excellent water resistance. Non-staining, non-bleeding, non-corrosive. Extremely tacky, do not cold flow at elevated temperatures. High elongation and cohesion, including many release-type surfaces as glass, polyethylene, etc.
Wat-R-Bar	Sealing in areas subject to frequent freeze-thaw cycling.	Permanently plastic, in bulk or extrusions. Excellent resistance to deterioration caused by freeze-thaw cycling. Good adhesion, water-resistance. Non-shrinking. Won't stain or soften lacquer, swell most rubbers or plastics. Will not flow at 400°F.
Presst-O-Cel	Insulating refrigerant lines. Controls condensation, sweating, and provides vapor barrier.	Closed-cell sponge tubing. Excellent water and air-tightness. Resists oil, acid, alkali. High insulation factor, non-inflammable. Lightweight. Long life. Resistant to rodents, vermin and fungi.
Thermal Mastics	For implementing heat transfer from tubing to liner on cold wall evaporators.	Non-volatile, non-shrinking. Non-contaminating. Long shelf life. Good adhesion, excellent water resistance. Applied by trowel, caulk or flow gun, spray or splatter gun.

OVER 400 SEALANTS for Every Sealing Need

Presstite produces a comprehensive line of more than 400 sealing and caulking compounds—to meet the specific needs of scores of American industries. New products are being added and existing products improved through a program of continuous research, in order to keep pace with growing needs, revisions or improvements in sealing techniques.

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Our technical facilities and personnel are always at your disposal for consultation and suggestions as to possible solution to your sealing problems. Tell us the product involved, area of application, problem encountered, characteristics required and, if possible, send us a drawing of your product. There's never any cost or obligation for this service.

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GENERAL OFFICE: 39th & Chouteau, St. Louis 10, Missouri, MOhawk 4-6000

Some examples of how the Diversey DS-9 Bright Dip process can solve finishing problems and lower costs. Left, cutaway of welded stainless canteen finished inside and out in a single immersion. Also shown: stainless steel pen points, stainless forgings completely de-scaled, and a stainless plate Bright-Dipped for a lustrous specular finish.

New Diversey DS-9 Bright Dip for 300 Series Stainless Steel

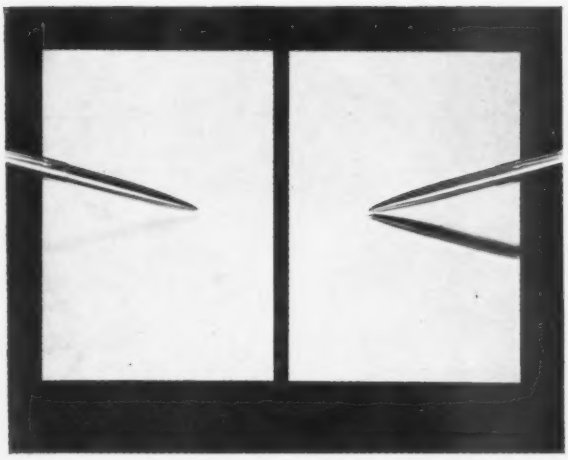
NOW—a specular finish on stainless steel without buffing or polishing!

Diversey introduces a simple immersion process that can mean lower production costs to any stainless steel fabricator. The Diversey DS-9 Bright Dip process has proved conclusively, on the production line, that it can . . .

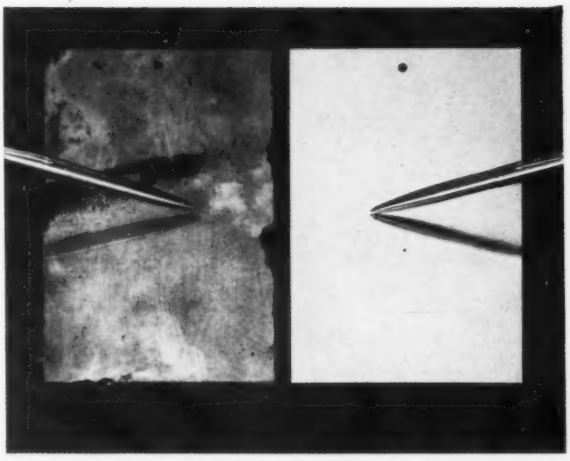
- eliminate buffing, electropolishing or grinding on many parts
- produce a bright, specular finish on stainless steel in the 300 series
- remove scale from stainless steel forgings
- remove weld scale and discoloration
- put a brilliant finish on intricate, hard-to-polish shapes in the 300 series

No electrical current used.

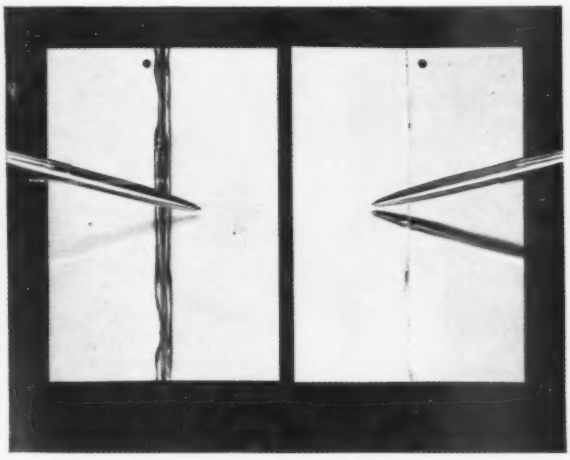
See for yourself how Diversey Bright Dip can save money on your production line



For a specular finish: *Left*, a 302-2B Mill Finish stainless sheet. *Right*, the same steel after immersion in Bright Dip.



To remove scale after heat treating. *Left*, heat treated stainless plate. *Right*, same steel after DS-9 Bright Dip process removed scale.



To remove weld scale from most stainless steel alloys. *Left*, stainless plate with weld seam. *Right*, after DS-9 Bright Dip, showing weld scale completely removed.

To remove scale from forgings of most stainless steel alloys. *Left*, stainless steel forging before and (*right*) after cleaning and finishing in DS-9 Bright Dip.

Try DS-9 Bright Dip in your plant. A trial order of Diversey DS-9 Bright Dip concentrates is available at nominal cost.

If you use stainless steel in the 300 series, it will pay you to get complete information on new Diversey DS-9 Bright Dip. *Write to Metal Industries Department, The Diversey Corporation, 1820 Roscoe Street, Chicago 13, Illinois.*

DIVERSEY.® DS-9 BRIGHT DIP ®

1820 WEST ROSCOE STREET, CHICAGO 13, ILLINOIS

Editor's mail

→ *from Page 20*

Excellent response

Gentlemen: We wish to thank you for your nice photograph and description of our L. M. R. Vinyl Grommets which you printed in the New Products section of your February, 1959 issue of METAL PRODUCTS MANUFACTURING.

The response through your magazine has been exceptionally good.

Lamar E. Schwalke, President
L. M. R. Engineering Corp.
St. Louis, Mo.

Bound into yearly volumes

Gentlemen: We are in the process of having our METAL PRODUCTS MANUFACTURING magazines bound into yearly volumes; however, we cannot locate our September, 1957 issue. If this is still available, we would appreciate very much your sending this issue to our laboratory at Monroe and Progress Sts., Union, N. J., together with the bill for any cost involved.

John T. Burwell, Jr., Director of Research
American Radiator & Standard Sanitary Corp.
New York City, N. Y.

The issue in question is on its way to Mr. Burwell.

The Editors

NARDA service management school

Gentlemen: Well, you did us up proud! Thank you so very much. We all appreciated it very much, and you did a wonderful job of it. *(See Finish Line Editorial, "Service Management Schools," Page 71, March, 1959 issue of* MPM.*)*

You might be interested to know that the School of Service Management enrollment has had to be boosted twice, to the maximum of the classroom capacity, now hitting the 135 figure.

Helen-Michelle Rodgers
Director of Member Services
National Appliance & Radio-TV Dealers Assn.
Chicago, Ill.

Vinyl to metal

Gentlemen: Thank you very much for sending me the six copies of your March issue of MPM. The article "Bonding vinyl to metal at 20 feet per minute" was very well done, and it was indeed a very pleasant surprise to walk into the Westinghouse Electric Corporation office last Thursday and find that the two buyers I talked to had already read it.

George Friedman
Special Products Division
Shwayder Bros., Inc.
Detroit, Mich.

when the time comes...

for new and better glass products — whether it be today or 2000 A.D. — Marsco's craftsmen engineering team will develop them.

The Junior Spaceman above has the best in interplanetary protection — a glass space helmet — because glass can be bowed to fit any desired shape and yet it can be tempered to impart extreme resistance to impact.

You or your family don't need space helmets today but chances are glass could improve the utility and beauty of your product and make it more salable today.

Let Marsco's craftsmen engineering team impart to your product all the advantages of glass.

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Marsco

Here are some of the applications for Marsco heat-treated, tempered and hardened glass parts:

- CLOCK & TIMER CRYSTALS
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- AIRCRAFT ACCESSORIES
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- DIALS & NAME PLATES
- TELEVISION EQUIPMENT
- INSTRUMENTS
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Come snow, sleet or hail, Glidden finishes provide *real umbrella protection*—against extreme temperatures, humidity, corrosion, impact, fading, staining and all other enemies of product finishes.

Glidden industrial finishes insure the special protection your particular products need because they are custom-formulated.

Glidden Technical Service—the most thorough and practical in the industry—includes complete analyses of finishing problems *in your plant* by experienced technicians.

For *real umbrella protection,* use both—Glidden Finishes plus Glidden Technical Service—whatever your product, process or problem.

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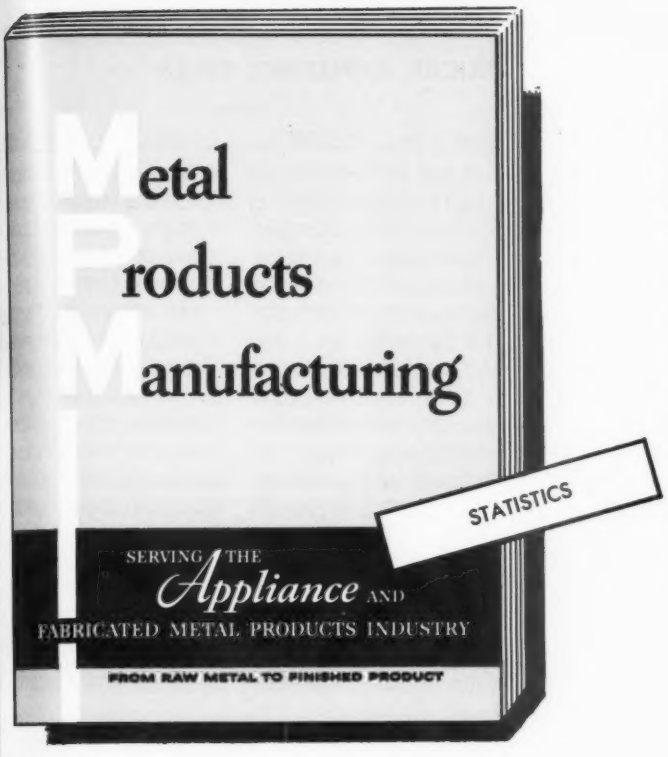
"THE GLIDDEN UMBRELLA" of protection combines comprehensive technical service and custom-formulation of product finishes for all industry.



The latter half of 1958 saw increases in factory shipments and/or sales of most major appliances that were sufficient enough to send the totals for the year 1958 over the figures recorded for 1957. These were gas and electric ranges, free standing, refrigerators, and some laundry appliances. Built-in ranges, both gas and electric, were well ahead of 1957. Water heaters, gas furnaces, electric freezers, dishwashers, waste disposers, vacuum cleaners and metal furniture were well ahead of 1957. Statistics reported for January 1959 (See Metal Products Statistics, Page 100) show increases over January 1958. The upward trend shows definite signs of continuing through 1959.

Sixth annual market and statistical review of the appliance and fabricated metal products manufacturing field

SUMMARY — FACTORY SHIPMENTS AND/OR SALES

(Typical segments only — data not available for many groups)

	Units Shipped				
Product	1954	1955	1956	1957	1958
Air Conditioners, room	1,218,000	1,270,000	1,600,000	1,592,000	1,600,000
Electrical Appliances	62,234,000	70,750,000	79,942,000	69,303,000	66,197,000
Cooking & Heating Equipment (non electric)	8,967,606	11,081,857	10,669,626	8,984,700	9,498,000
Home Laundry Equipment (domestic only)	4,474,168	5,702,859	6,227,000	5,067,690	5,042,922
Plumbing Ware	5,841,017	6,594,644	6,001,302	4,546,000	5,546,000
Steel Kitchen Cabinets	3,372,000	4,046,000	3,641,000	2,490,000	2,000,000
Vacuum Cleaners	2,658,136	3,270,441	3,721,870	3,190,172	3,295,047
TOTAL UNITS	88,776,927	102,845,801	111,972,802	98,393,562	93,238,969

ELECTRICAL APPLIANCE SALES

Product	1954 Units	1954 Retail Value	1955 Units	1955 Retail Value	1956 Units	1956 Retail Value	1957 Units	1957 Retail
Coffee Makers	3,450,000	$ 68,674,500	3,675,000	$ 71,662,500	5,100,000	$ 98,685,000	4,400,00	85,
Dehumidifiers	76,000	10,260,000	96,000	12,192,000	275,000	36,025,000	225,00	26,
Dishwashers	215,000	64,500,000	295,000	90,270,000	400,000	116,000,000	390,00	104,
Fans	6,735,000	251,116,500	5,585,000	203,392,000	6,590,000	246,501,000	5,293,00	191,
Food Waste Disposers	400,000	47,980,000	520,000	59,800,000	590,000	64,900,000	550,00	49,
Freezers	990,000	391,425,000	1,100,000	439,945,000	975,000	380,200,000	925,00	346,
Heaters	1,330,000	34,232,500	3,360,000	100,227,000	3,622,000	104,248,000	3,710,00	108,
Hotplates	710,000	5,928,500	950,000	7,362,500	760,000	6,042,000	660,00	5,
Irons	6,583,300	95,062,300	7,930,000	112,871,000	8,715,000	122,743,500	7,635,00	117,
Radios	6,276,000	188,787,400	7,665,000	244,609,600	9,200,000	293,100,000	9,800,00	322
Ranges	1,350,000	353,700,000	1,600,000	423,800,000	1,585,000	412,645,000	1,365,00	360
Refrigerators	3,600,000	1,095,865,000	4,200,000	1,323,000,000	3,700,000	1,202,500,000	3,350,00	,072
Television	7,346,700	1,689,741,000	7,756,500	1,745,212,000	7,200,000	1,368,000,000	6,500,00	,235
Toasters	3,110,000	52,226,600	3,565,000	60,242,500	3,930,000	69,592,700	4,000,00	71
Waffle Irons	928,000	17,354,000	995,000	18,905,000	965,000	19,250,000	895,00	17
Water Heaters	800,000	101,337,500	900,000	103,500,000	870,000	100,050,000	800,00	84
Water Systems	728,000	123,400,000	788,000	130,000,000	775,000	120,125,000	750,00	112
Other Small Appliances	17,256,000	383,771,700	19,440,000	419,841,200	23,875,000	421,744,000	26,055,00	449
Total	62,234,000	$4,989,345,000	70,750,500	$5,580,015,800	79,942,000	$5,191,351,200	69,303,00	,761

*Including Blenders, Deep Fat Fryers, Floor Polishers, Food Mixers, Shavers, Broilers, Clocks.
Source: Electrical Merchandising.

VACUUM CLEANERS

Product	1954 Units	1954 Estimated Retail Value	1955 Units	1955 Estimated Retail Value	1956 Units	1956 Estimated Retail Value	1957 Units	1957 Estimated Retail Value	Uni
Vacuum Cleaners	2,658,136	$251,858,400	3,270,441	$307,421,454	3,721,870	$353,577,650	3,190,172	$302,000,00	295,

Source: Vacuum Cleaner Manufacturers' Assn. (Retail value estimated by MPM)

COOKING AND HEATING EQUIPMENT—NON ELECTRIC

Product	1953 Units Shipped	1953 Value	1954 Units Shipped	1954 Value	1955 Units Shipped	1955 Value	1956 Units Shipped	
Cooking Stoves & Ranges	2,385,983	$205,819,000	2,207,489	$182,743,700	2,509,036	$224,277,000	2,276,902	$21
Gas, total	2,097,462		1,967,113		2,269,673		2,069,54	
Free-Standing								
Built-In								
Coal & Wood	83,062		67,897		69,851		58,47	
Kerosene	117,606		109,273		108,257		88,14	
Domestic Heating Stoves	3,278,473	84,649,000	2,278,661	61,002,400	3,017,748	75,659,000	3,040,998	
Floor & Wall Furnaces	551,614	36,198,000	539,894	31,063,100	614,584	39,121,000	491,930	
Water Heaters	2,183,000	114,607,500	2,281,100	119,757,800	2,884,104	154,603,000	2,933,919	1
Oil Burners	579,696	58,320,000	528,500	56,062,300	650,241	59,693,000	571,105	
Residential	540,774		494,259		609,639	44,668,000	531,990	
Commercial & Industrial	38,922		34,321		40,602	15,025,000	39,115	
Warm Air Furnaces	996,603	197,275,000	1,131,882	205,895,200	1,406,144	263,865,000	1,354,772	2
Total	9,975,369	$696,868,500	8,967,606	$656,524,500	11,081,857	$817,218,000	10,669,626	$8

Source: Gas Appliance Manufacturers' Assn. and Facts for Industry.

1957 Units	Retail Value	1958 Units	Retail Value
,400,00	85,850,000	4,200,000	$ 79,590,000
225,00	26,100,000	210,000	22,050,000
390,00	104,250,000	400,000	110,000,000
,293,00	191,097,000	4,332,000	155,533,000
550,00	49,473,000	620,000	55,769,000
925,00	346,875,000	1,100,000	385,000,000
,710,00	108,448,000	3,850,000	113,660,000
660,00	5,247,000	610,000	4,850,000
,635,00	117,868,000	5,550,000	86,072,000
,800,00	322,700,000	6,000,000	305,900,000
,365,00	360,775,000	1,335,000	354,870,000
,350,00	,072,000,000	3,050,000	976,000,000
,500,00	,235,000,000	5,300,000	1,086,500,000
,000,00	71,874,000	3,400,000	61,290,000
895,00	17,855,000	775,000	15,460,000
800,00	84,000,000	820,000	86,100,000
750,00	112,500,000	720,000	111,600,000
,055,00	449,486,000	24,925,000	794,347,000
,303,00	,761,398,000	66,197,000	$ 4,724,591,000

57	1958	
Estimated etail Valu	Units	Estimated Retail Value
302,000,00	,295,047	$309,000,000

HOME LAUNDRY EQUIPMENT

1958

Product	Units	Value
Domestic		
Washer-Dryers	168,375	$ 54,000,000
Washing Machines	3,672,349	852,000,000
Dryers	1,202,198	264,000,000
Total	5,042,922	$1,170,000,000

1957

Product	Units	Value
Domestic		
Washer-Dryer Machines	175,841	$ 58,000,000
Washing Machines	3,589,576	845,000,000
Ironing Machines	41,631	8,600,000
Dryers	1,260,642	276,000,000
Total	5,067,690	$1,187,600,000
Export totals unavailable		

1956

Product	Units	Value
Domestic		
Washer-Dryer Machines	102,406	$ 36,000,000
Washers	4,344,848	1,020,000,000
Dryers	1,499,304	328,000,000
Ironers	58,493	12,200,000
Total	6,005,051	$1,396,200,000
Export totals unavailable		

1955

Product	Units	Value
Domestic		
Washing Machines	4,236,555	$ 997,678,503
Ironing Machines	81,910	17,283,010
Dryers	1,384,394	305,082,774
Total	5,702,859	$1,320,044,287
Export totals unavailable		

1954

Product	Units	Value
Domestic		
Washing Machines	3,490,212	$ 807,781,875
Ironing Machines	86,205	17,844,435
Dryers	897,751	209,290,171
Total	4,474,168	$1,034,916,481
Export totals unavailable		

Source: American Home Laundry Manufacturers' Assn.
Retail value estimated by MPM

ECTRIC 1956 its Shipped	Value	1957 Units Shipped	Value	1958 Units Shipped	Value
276,902	$217,603,000	1,935,000	$174,000,000	2,050,000	$169,111,000
2,069,54		1,968,600		1,900,100	
				1,668,300	
				231,800	
58,47		49,700		47,082	2,422,000
88,14		87,000		264,613	3,762,000
940,998	80,906,000	2,840,000	75,500,000	2,138,084	65,953,000
391,930	34,895,000	440,000	31,200,000	457,710	31,029,000
933,919	162,097,000	2,544,500	141,500,000	2,675,000	151,000,000
571,105	49,528,000	521,000	45,000,000	384,531	36,811,000
531,990	35,939,000	470,000		353,935	21,918,000
39,115	13,589,000	51,000		30,596	14,893,000
854,772	260,694,000	704,200	135,000,000	850,000	160,000,000
669,626	$805,723,000	8,984,700	$602,200,000	9,498,000	$740,000,000

STEEL KITCHEN CABINETS

	1958
Units Sold	2,000,000
Retail Value	$125,000,000
	1957
Units Sold	2,490,000
Retail Value	$150,120,000
	1956
Units Sold	3,641,000
Retail Value	$188,395,000
	1955
Units Sold	4,046,000
Retail Value	$209,328,000
	1954
Units Sold	3,372,000
Retail Value	$174,440,000
	1953
Units Sold	3,441,000
Retail Value	$178,000,000

Source: Steel Kitchen Cabinet Manufacturers' Association and Electrical Merchandising.

AIR CONDITIONERS

(Units Sold)

	1954	1955	1956	1957	1958
Room Air-Conditioners..	1,218,000	1,270,000	1,600,000	1,592,000	1,600,000
Central Air-Conditioning	12,000	130,000	170,000	220,000	224,395
Total	1,230,000	1,400,000	1,770,000	1,812,000	1,824,395
Estimated Retail Value..	$419,298,000	$412,000,000	$495,400,000	$507,000,000	$513,000,000

Source: Air-Conditioning and Refrigeration Institute
NEMA, Value Estimated by MPM.

ESTIMATED SALES ELECTRIC APPLIANCES 1958

(Including Exports)

	% Increase	Units Total
Dehumidifiers	+ 7.1	225,000
Dishwashers	+12.5	450,000
Food Waste Disposers	+12.9	700,000
Farm and Home Freezers	0	1,100,000
Ranges:		
Standard	+ 6.3	850,000
Built-Ins	+12.1	600,000
Total	+ 8.6	1,450,000
Electric Refrigerators	+ 4.9	3,200,000
Electric Storage Water Heaters...	+ 2.4	840,000
Room Air Conditioners.....	— 6.3	1,500,000

Source: NEMA

PLUMBING FIXTURES

(Units Shipped)

Product	1951	1952	1953	1954	1955	1956	1957	1958
Lavatories								
Cast Iron	1,630,554	1,217,333	1,337,865	1,342,389	1,540,111	1,365,896	1,200,000	1,300,000
Steel	232,699	219,374	213,293	248,301	303,955	308,724	230,000	245,000
Total	1,863,253	1,436,707	1,551,158	1,590,690	1,844,066	1,674,620	1,430,000	1,545,000
Kitchen Sinks								
Cast Iron	1,212,586	1,000,835	1,022,101	1,008,873	1,060,086	921,358	560,000	760,000
Steel	1,196,859	1,015,328	1,096,584	1,169,121	1,363,971	1,318,076	730,000	1,200,000
Total	2,409,445	2,016,163	2,118,955	2,177,994	2,424,057	2,239,434	1,290,000	1,960,000
Bathtubs								
Cast Iron	1,504,471	1,355,181	1,434,881	1,507,786	1,678,467	1,485,503	1,230,000	1,330,000
Steel	413,477	454,500	456,199	564,547	648,054	601,745	596,000	710,000
Total	1,917,948	1,809,681	1,891,080	2,072,333	2,326,521	2,087,248	1,826,000	2,041,000

Source: Facts for Industry.

Much as a child works with building blocks, so has Lennox Industries worked with air conditioning blocks. In this case, the blocks are cooling, heating, and blower-filter sections, designed for easy selection to cut installation costs and ease handling. Electrical interlock permits pairing of units.

New Lennox "building block" all-season air conditioners

all-electric combination feature of heating-cooling line

ELECTRIC HEATING IS GROWING spectacularly, but only the convection type of electric heating system can produce complete and proper overall indoor comfort in homes, since the essential features of continuous air circulation and filtering are maintained." This statement was attributed recently to John W. Norris, president, Lennox Industries, Inc., Marshalltown, Iowa.

Proceeding on this theory, the Lennox people have added to their "Landmark" line an electric, year-round, combination heating-cooling-blower-filter unit for greater efficiency and durability. In the new series, heating, cooling and blower-filter elements are enclosed in separate cabinets, permitting correct selection of air delivery, heating, and cooling capacities.

Btu furnace output ranges from 68,000 to 123,000, kw requirements from 20 to 36 (using single or three-phase current), cfm from 620 to 2,200, and thermostats are of the two-stage variety, pulling in part of the heating capacity on the first stage, and all of it on the second.

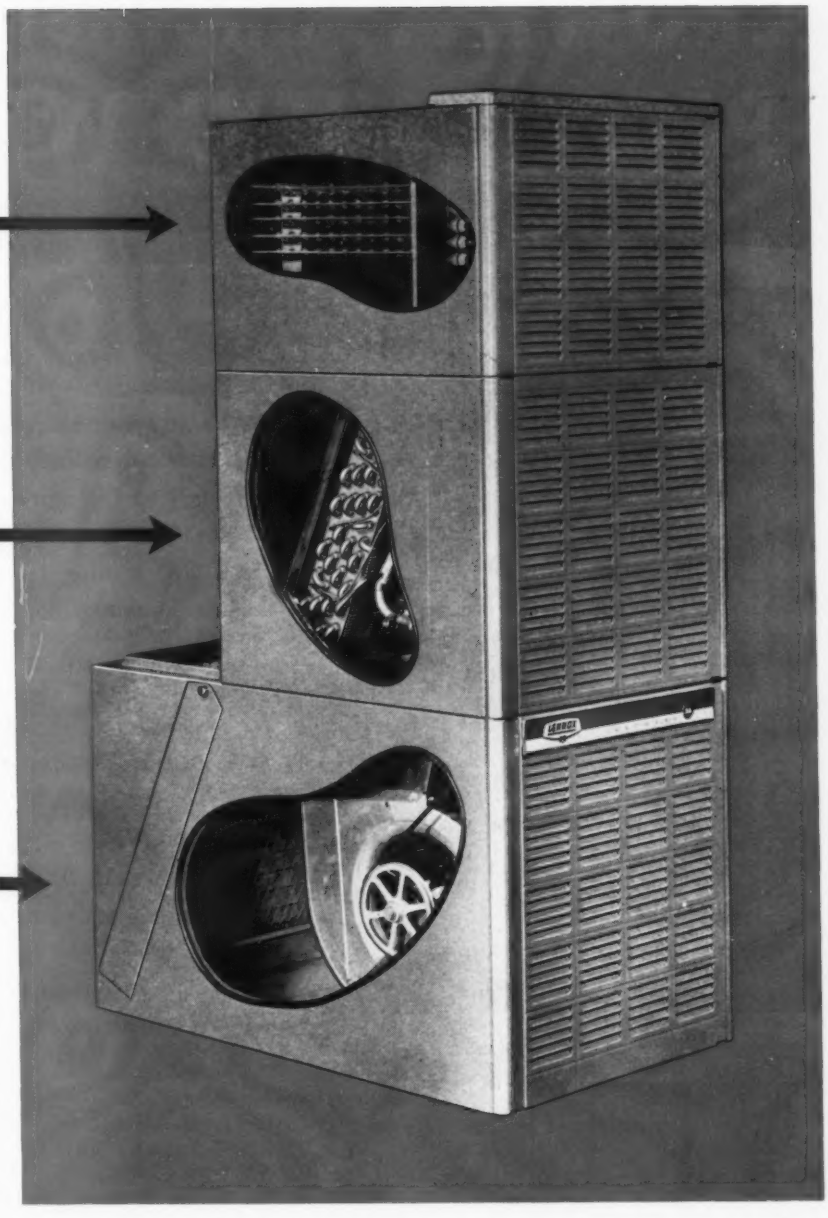
However, the most impressive qualities of this combination unit may lie in its advanced design and styling. The unit can be placed where heating equipment may not normally be found, due to space-saving dimensions and increased quietness. One-half inch of glass fiber insulation and permanently-lubricated, sealed ball bearings in the blower sec-

Basement comfort is a reality with the "Landmark" year-round unit. Advanced design and styling lets the unit fit into a leisurely decor. A louvered treatment of the cabinet doors enhances the appearance. The baked-on enamel stays bright, with no raw edges to rust.

The ELECTRIC RESISTANCE HEATING section is 19 inches high. Btu output ranges from 68,300 to 123,000, with kw requirements from 20 to 36 (using single or three-phase current), and cfm from 620 to 2,200. Thermostats are two-stage, pulling in part of the heating capacity on the first stage, and all on the second.

The COOLING COIL section uses a single evaporator to simplify running refrigerant lines. Evaporators are positioned for low air resistance. Coil fins are rippled at the outer edge for additional strength. The compressor units (not shown) are located remotely out-of-doors.

The BLOWER-FILTER section uses a single, two-speed blower for both heating and cooling. This cabinet is lined with one-half inch accoustical glass fiber insulation to cut noise. The motor rides a cradle close to the blower wheel's center of gravity. Hammock-shaped, continuous glass fiber filter with edge seal offers 50 per cent more surface than other throw away filters.



ALL-SEASON UP-FLO AIR CONDITIONER WITH BASEMENT FILTER-BLOWER SECTION

tion are among the noise-reducing features. For reduced height of basement installations, a special blower-filter section is included in the line.

The designers, Waltman Associates, Chicago, chose a louvered treatment of the cabinet doors to allow necessary ventilation and enhance the appearance. The separate cabinets are aligned by centering pins to give the idea of a single cabinet, although the doors may easily be removed for servicing.

One of the key features of the unit is a single blower for heating and cooling. This permits elimination of dampers and accompanying air leakage, reduction of space, and straighter air flow. This straightened air flow results in less noise, savings in power consumption, and subsequent fuel reduction. Maximum air volumes moved by the blower range from 1,600 to 4,400 cubic feet per minute. The blower's motor rides a cradle very close to the blower wheel's center of gravity, further reducing noise and vibration.

Cooling coil sections use single evaporators to simplify running refrigerant lines. These are positioned for low air resistance. Coil fins are then rippled at the outer edge for additional strength. Compressor units, with two- to ten-ton capacities, are located remotely out-of-doors.

All cabinets are 28⅛" in depth, with the exception of the special basement model, which is 42" deep. Heights of the three "blocks" are as follows: Furnaces: Up-Flo, 54⅝"; Down-Flo, 63⅝"; Basement model, 47". Cooling Coils: Up-Flo, 59¾"; Down-Flo, 54⅝"; Coils with extra space section, 88¾". Blower-Filters: Up-Flo, 78¾"; Down-Flo, 82⅝"; Basement model, 71⅛".

A choice of fuels and capacities are available with respect to the heating section. Both gas and oil units have 16 gauge aluminized steel heat exchangers for protection against acid corrosion. Gas sections incorporate steel "ribbon" ports, while oil sections use a new "midget" burner for added efficiency, and a lining of silica felt to muffle combustion sound.

An added feature of the Lennox line is a new heat pump. The pump's indoor unit has an extra coil to guard against overloading and overheating in mild weather. The compressor unit is positioned out-of-doors, as is the cooling compressor.

CROWN... another user of PERMA-VIEW WINDOWS

A great majority of the leading manufacturers of ranges (both free-standing and built-in) now use PERMA-VIEW windows to enhance the appearance and convenience and economy of their products. During the past few years the demand for "visible baking" has contined to grow. This "No-Fog" window is the best and most economical answer to this demand.

The PERMA-VIEW window is pre-engineered and comes to you ready for immediate installation in your range, "out of our carton into your door." It is mechanically sealed to prevent infiltration of vapors and to eliminate "fogging." Let our specialized production lines serve as a part of your sub-assembly facilities. If you do not use a window, if you make your own window, or if you buy your window from another source, we suggest you phone or write us for complete details on the ease and economy of adding this proven sales feature to your new ranges.

CROWN STOVE WORKS
one of the
80 leading range manufacturers
using
PERMA-VIEW oven-door windows

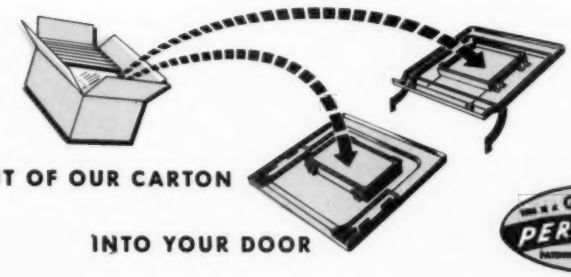
ROUND

SQUARE

RECTANGULAR

TRAPEZOID

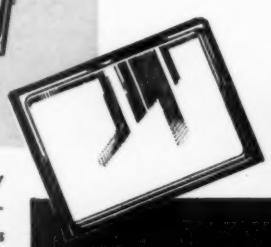
We can manufacture any shape, any size, any thickness to meet your engineering requirements. Alternate methods of attachment may be used.



OUT OF OUR CARTON

INTO YOUR DOOR

GENUINE PERMA-VIEW NON-FOG



MILLS PRODUCTS INCORPORATED

1015 WEST MAPLE ROAD • WALLED LAKE, MICHIGAN

Fabrication of the stainless steels

by Lester F. Spencer • CONSULTANT

workability, forming, and welding properties correlated with the various types of stainless steel

PART TWO

MPM EXCLUSIVE FEATURE

THE SPINNING OPERATION is performed on rigidly-built lathes to produce small quantities of symmetrically round parts. Tool costs are relatively low and, as the size of the part and its complexity increases, spinning becomes more economical than die forming, especially if the parts are tapered or contain undercuts. The radii should be at least five times the metal thickness. Working the stainless steels differs in that the material is spun loosely over the corners, then worked back to minimize work hardening. In forming re-entrant corners, first spin the metal form radius to radius, then stretch it into the corner. The lathe speed for the austenitic alloys should be one-half to one-fourth that used for copper, and both the ferritic and martensitic alloys should be spun at about two-thirds the speed used for carbon steel. To avoid cracking along the periphery of the blank during the final stages of spinning, a narrow flange should be retained for strengthening. The spinning should always progress from the center to the edge to minimize this danger of cracking.

Contour Forming — Forming shaped sections to desired contours is difficult to perform by the usual forming methods since the shape of the section imparts a stiffness meant to resist just such deformation. However, the stainless steels can be successfully formed by either roll bending, wiper bending, or stretch forming. In these processes, the shaped metal is bent over a die which imparts the contour shape without changing the cross section of the part.

Roll Bending — Both three-point loading and wiping are used as roll bending principles in forming the stainless steels. In three-point loading, the curvature is determined by tool setting rather than by close contact with the die. In the wiper type of roll bending, curvature is obtained progressively by forcing the part against the roll surfaces. As in the other processes described, the equipment must be more powerful than that used for the carbon steels, greater tool wear is experienced, and a lubricant is recommended to reduce friction.

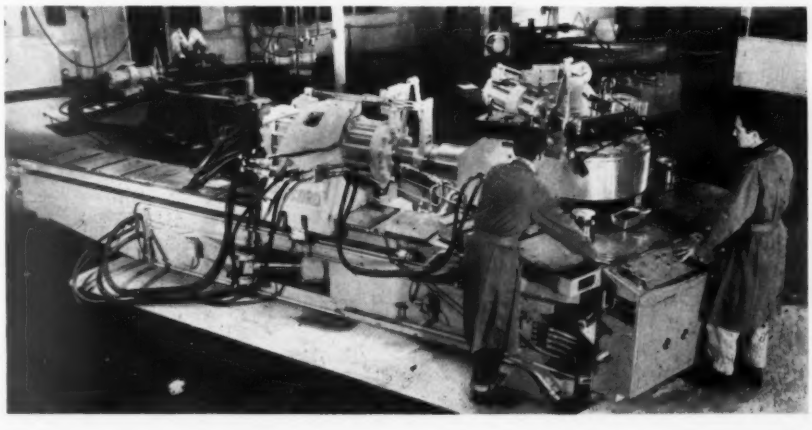
Wiper Forming — Wiper or compression forming is used in obtaining contours of changing radii in a single plane, the curvature being formed by the relative motion of the tool against the section, forcing it progressively against the formblock. Tool pressures are relatively low since only a small section is formed at one time.

Stretch Forming — This is an excellent method in forming the stainless steels, the small amount of springback along with the absence of wrinkling being inherent characteristics. In this process, the outer fibers of the section are stretched over a formblock. Either mechanical or hydraulic equipment may be used to apply the stretching tension, hydraulic equipment being preferred due to the realization of closer control. In operation, grips of knurled surfaces hold the sheet tightly on each end to prevent slipping. Stretching then begins; the section is placed under a tension slightly lower than the yield point. Forming then begins with tension increasing gradually as the part is wrapped around the formblock, this forming taking place well within the plastic range. The final operation is a "setting" operation at which time a relatively-high tension is placed on the sheet.

A few words can be given on tube forming. In general, the stainless steels may be bent to the same minimum radii as that used for the carbon steels. Bends can be made with or without

PHOTO COURTESY HUFFORD MACHINE CO.

Semi-automatic stretch forming equipment for forming narrow sheets and extrusions.



the use of a mandrel. Where no mandrel is used, with the result that there is no ID support, either the press, upsetter, bulldozer, or table-type tube bending device is used. Mandrel bends are made using a mechanical or hydraulic tube bending machine. The location of the mandrel in the tube can be controlled at the bend area, Fig. 1 illustrating the proper selection of mandrel type and other considerations when bending tubing.

Protection of polished sheet

The lustrous finishes obtained on Nos. 4, 6, 7, and 8 sheet stock is the result of extensive polishing at the mill, these high finishes being frequently required in the production of equipment for restuarants, hospitals, dairies, architectural applications, etc. To realize a return on the added cost of these high surface finishes, and to maintain minimum fabrication costs, it is essential that precautions are taken to avoid scratches, dents, or any other surface imperfections that will mar the high finish.

The initial consideration would be the condition of the metal working dies, they being well polished and maintained in a highly-polished condition throughout the working operation. Any sign of "pick-ups" should serve as a warning, the operation halted, and the dies stoned and polished. The second consideration would be the use of a covering material that would protect the surface of the sheet being formed. One method would be the use of adhesive tape directly on the dies, preventing metal-to-metal contact. This would be applicable where simple bending operations are performed. Another method would be the use of a paper of Kraft quality which can be pasted to the sheet. Although other materials such as wax paper, oiled paper, etc. can be used equally as well, the important factor is the elimination of surface markings. Of more recent origin is the use of a sprayed or brushed latex base, or plastic-base compounds which have met with remarkable success. Removal of the latter-mentioned coating after forming is completed can easily be done.

Welding the stainless steels

The austenitic grades are readily welded by all fusion and resistance methods. The major difficulty is the formation of intergranular carbides during welding which does not affect structural strength, but may lead to failure if the part is subjected to severe corrosive environments. Restriction in the formation of these harmful carbides can be realized in a number of ways. As the weld progresses, a stream of water can be directed on the weld from one to four inches behind the torch, this quenching effect discouraging the formation of carbides. Another method would be the use of a regenerative anneal; however, where this is not feasible, the low carbon stainless, type 304, or the stabilized grades of stainless, types 321 and 347, can be used.

The ferritic stainless can also be welded; however, the resultant joint will be relatively brittle due to grain growth in both the weld and the heat-affected area. While heating to 1,400/1,500° F. and fast cooling can relieve this brittleness somewhat, the ductility is not sufficient for applications subject to vibration or bending at room temperatures. The best properties for room temperature application will be obtained on thin sections where welding can be performed in a few seconds. Since ferritic welds are quite ductile at elevated temperatures, the ferritic steels find wide usage in high temperature applications.

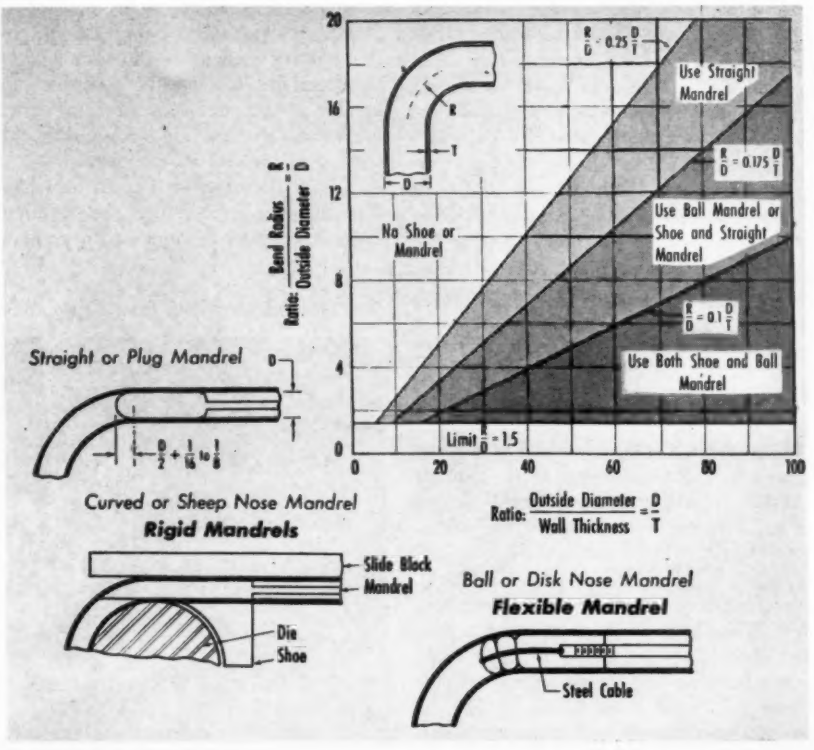
Fusion welding of the martensitic stainless alloys may be successful, provided precautions of pre- and post-heating is taken. These alloys are air hardening, and shrinkage cracks may develop upon air cooling. For this reason, resistance welding of these grades is not recommended except for special cases where adequate post-heating can be applied after welding. The lower carbon grades (types 403 and 410) can usually be welded satisfactorily; yet, as the carbon increases, hardenability increases with a corresponding increase of attendent cracking and embrittlement of welds.

Resistance Welding — Due to the lower heat conductivity, lower melting point, and better contact resistance of the stainless steels, a spot welding procedure, when compared to the welding of carbon steel, will require less heat and more pressure for similar gages. If an operator is welding 20-gage carbon steel, the change to the same gage for stainless could be made either by dropping the switch one point or reducing the time slightly, or both. The exact procedure requires individual experimentation, balancing one variable against the other until the desired result is obtained. The data given in Table 1 can be used as a guide. A good spot will permit twisting of the welded sheets in their own plane for nearly 90° before the weld nugget pulls out of the sheet.

The spot welding of polished sheets requires judicial placement of spots in the least conspicuous position, since it is often difficult to refinish the welds and have the same color if the entire piece is not refinished. This depends, to a large extent, upon the finish of the

FIG. 1

ILLUSTRATION COURTESY CRUCIBLE STEEL CO. OF AMERICA



sheets. A blue oxide may appear on the surface of a spot weld which, when exposed to weathering, may slowly change to a rust color. This is but a surface condition; however, good procedure dictates that these spots be cleaned.

Pulsation welding can also be used equally as well with the stainless steels. This makes possible the production welding of considerably-thicker material than with spot welding. The use of projection welding is also feasible, this having the advantage in that numerous welds can be produced in one operation. In addition, this method can be applied to irregularly-shaped parts that cannot be conveniently or economically handled by other resistance welding methods.

Essentially, seam welding is a continuous spot welding process. Sometimes called "line" or "stitch" welding, seam welding consists of producing a series of spot welds by means of rotating cooled-wheel electrodes. Electronic devices are most satisfactory for current interruption, to make certain that welds overlap sufficiently but not too much. Water and gas-tight joints are readily produced by seam welding, and very little discoloration or distortion is experienced.

Fusion Welding — The oxyacetylene method is used extensively in joining the lighter gages of stainless, such as 20-gage and thinner. The flame should be as small as possible to supply just enough heat to produce good fusion. It should also be slightly on the reducing side. As in welding of other materials, clamping is required to maintain alignment, and if this is not possible, tack welding is employed. Best results are obtained by applying a flux to the bottom side of the joint and using a bare wire of the same chemical composition as the plate for the filler rod. The filler rod should be held in the flame at all times to prevent oxidation of the molten globule. In addition, the weld metal should not be puddled with the end of the rod as is often done with ordinary steel.

The atomic hydrogen method is also well adapted for welding thin-gage stainless. The one precaution is that the chromium steels may absorb hydrogen which may produce a brittle joint. This condition can be relieved by post heating. However, this process is rapidly being replaced by those methods that use either argon or helium as the shielding gas. As in atomic hydrogen welding, the metal used to form the joint may come from melting-down the abutting edges of a joint, or by the addition of a filler rod that is of the same composition as the base metal. Tungsten electrodes are used. A superimposed high frequency current is recommended in ac welding due to its arc-stabilizing effect and, with the use of dc current, it is essential that straight polarity is employed. The use of superimposed high frequency current in dc welding is also desirable since it permits an arc to be struck without contact with the stainless steel, thus avoiding electrode fouling.

The submerged arc welding procedure is particularly well adapted, within certain limits, since it offers excellent protection to the molten stainless against excessive loss of alloying elements by oxidation. There is no flash or spatter, and the process is conducive to good fusion and proper cooling. For this reason, much higher currents and larger

to Page 70 →

Table 1 — Recommended Practices for Spot Welding Stainless Steels, from "Recommended Practices for Resistance Welding," 1950 edition.

Thickness of Thinnest Outside Piece (Notes 1 2, 3 & 4)	Electrode Diameter and Shape (Note 7)		Net Electrode Force	Weld Time *	Minimum Shear Strength, Lb.			Welding Current (Approx.) Amps		Diameter of Fused Zone	Minimum Weld Spacing (Note 6)	Minimum Contacting Overlap
					Ultimate Tensile Strength of Metal							
Inches	D, inches minimum	d, inches maximum	LB.	Cycles	70,000 up to 90,000 psi	90,000 up to 150,000 psi	150,000 psi and higher	Tensile Strength Below 150,000 psi	Tensile Strength 150,000 psi and Higher	Dw Inches Approx.	Inches	Inches
0.006	3/16	3/32	180	2	60	70	85	2,000	2,000	0.045	3/16	3/16
0.008	3/16	3/32	200	3	100	130	145	2,000	2,000	0.055	3/16	3/16
0.010	3/16	1/8	230	3	150	170	210	2,000	2,000	0.065	3/16	3/16
0.012	1/4	1/8	260	3	185	210	250	2,100	2,000	0.076	1/4	1/4
0.014	1/4	1/8	300	4	240	250	320	2,500	2,200	0.082	1/4	1/4
0.016	1/4	1/8	330	4	280	300	380	3,000	2,500	0.088	5/16	1/4
0.018	1/4	1/8	380	4	320	360	470	3,500	2,800	0.093	5/16	1/4
0.021	1/4	5/32	400	4	370	470	500	4,000	3,200	0.100	5/16	5/16
0.025	3/8	5/32	520	5	500	600	680	5,000	4,100	0.120	7/16	3/8
0.031	3/8	3/16	650	5	680	800	930	6,000	4,800	0.130	1/2	3/8
0.034	3/8	3/16	750	6	800	920	1,100	7,000	5,500	0.150	9/16	7/16
0.040	3/8	3/16	900	6	1,000	1,270	1,400	7,800	6,300	0.160	5/8	7/16
0.044	3/8	3/16	1000	8	1,200	1,450	1,700	8,700	7,000	0.180	11/16	7/16
0.050	1/2	1/4	1200	8	1,450	1,700	2,000	9,500	7,500	0.190	3/4	1/2
0.056	1/2	1/4	1350	10	1,700	2,000	2,450	10,300	8,300	0.210	7/8	5/8
0.062	1/2	1/4	1500	10	1,950	2,400	2,900	11,000	9,000	0.220	1.0	5/8
0.070	5/8	1/4	1700	12	2,400	2,800	3,550	12,300	10,000	0.250	1.125	5/8
0.078	5/8	5/16	1900	14	2,700	3,400	4,000	14,000	11,000	0.275	1.250	11/16
0.094	5/8	5/16	2400	16	3,500	4,200	5,300	15,700	12,700	0.285	1.375	3/4
0.109	1/2	3/8	2800	18	4,200	5,000	6,400	17,700	14,000	0.290	1.50	13/16
0.125	1/2	3/8	3300	20	5,000	6,000	7,600	18,000	15,500	0.300	2.0	7/8

*Single impulse, 60 cycles per second.

Notes — Types of steel — 301, 302, 303, 304, 308, 309, 310, 316, 317, 321, 347, and 349.

2. Material should be free from scale, oxides, paint, grease, and oil.
3. Welding conditions determined by thickness of thinnest outside piece.
4. Data for total thickness of pileup not exceeding 4T. Maximum ratio between two thicknesses 3 to 1.
5. Electrode Material — Class 2 — Class 3 — or — Class 11
   Minimum Conductivity — 75 per cent — 45 per cent — 30 per cent of copper
   Minimum Hardness — 75 per cent — 95 per cent — 98 Rockwell "B"
6. Minimum weld spacing (center line to center line) is that spacing for two pieces for which no special precautions need be taken to compensate for shunted-current effect of adjacent welds. For three pieces, increase spacing 30 per cent.
7. D refers to outside diameter of electrode; d refers to diameter of contact on chamfered electrode.

There is no substitute for stainless steel
in homes and home products

For the lady in the kitchen or the "chef" at the outdoor grill, there is nothing like the gleaming efficiency of Stainless Steel. Everything made of Stainless Steel has lasting beauty and is so easy to keep clean. No other metal contributes so much to better living.

Specify McLouth high quality sheet and strip Stainless Steel. McLouth Steel Corporation, Detroit 17, Michigan.

McLOUTH STAINLESS STEEL

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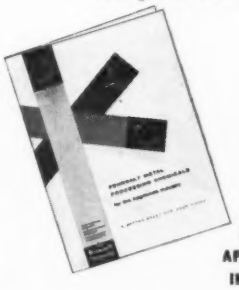

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MPM Suggestion Box

Adhesive salvages scrap tooling

scrap aluminum blocks bonded together by plant personnel get manufacturer out of tight fix

RYAN AERONAUTICAL CO., San Diego, Calif., has reported that it is now using structural metal-to-metal adhesives to salvage once-discarded scrap tooling and, in the process, is saving upwards of $20,000 annually in tooling costs.

The firm explains that this interesting application of aircraft adhesives arose out of an emergency problem. About a year ago, the company needed to produce, upon extremely-tight production schedules, molded fiberglass shells for wing-tip radomes on the Firebee, the drone target which Ryan manufactures in quantity for the Air Force and Navy.

"We needed a four-foot long male mold," stated Industrial Engineer Ted Grabowsky of the firm's tool fabrication division. "Investigation revealed that aluminum castings and patterns cost about $600, and that we could not expect delivery in less than six weeks."

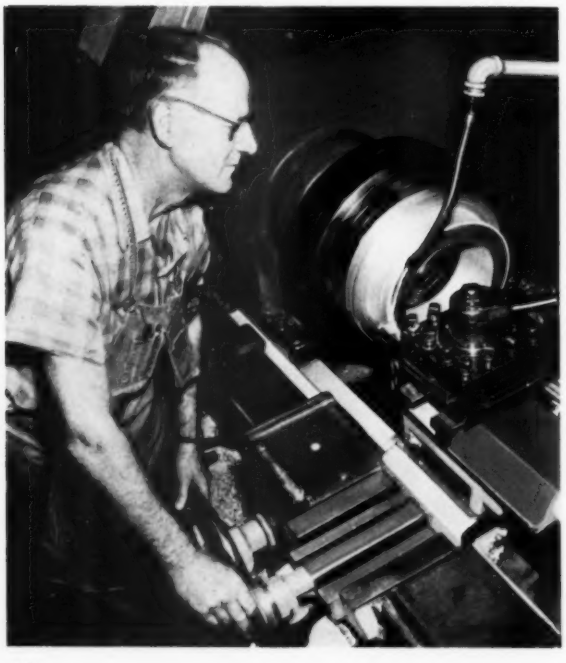
As an alternative, Ryan engineers conceived the idea of building the tooling mold in much the same patternmaking procedure by which wood blocks are glued together to build up a forming block. However, instead of wood blocks, scrap pieces of cast aluminum tooling metal were bonded together with a structural aircraft adhesive. The result: within ten days the firm not only had a workable mold, but in addition had produced the first Firebee radome.

An elastomer modified phenolic in unsupported film form, plus a liquid metal prime, was the material used.

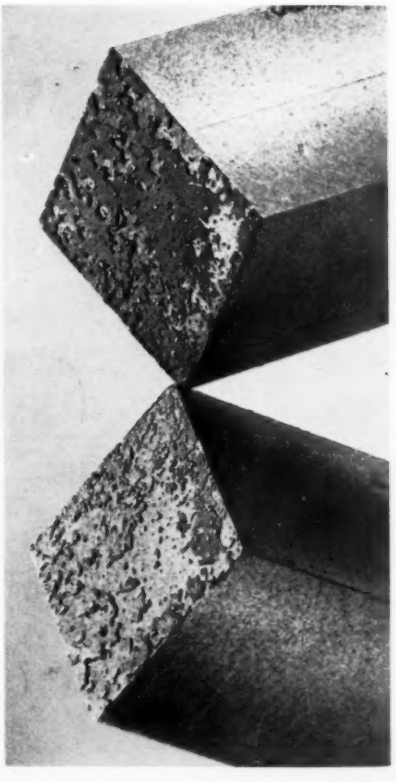
The following procedure is used for bonding the blocks. Metal surfaces are prepared for bonding by cleaning first with a methyl-ethyl-ketone wipe. Then follows an alkaline cleansing and a water rinse. After drying, faying surfaces are primed with the metal primer to 0.0005-inch thickness, and permitted to air-dry at room temperature for 60 minutes. Special tape is then interposed between the primed faying surfaces, and the assembly is subjected to a cure cycle of 350° F. at 100 psi for 60 minutes.

For further information, contact Special Projects Editor, METAL PRODUCTS MANUFACTURING, York St. at Park Ave., Elmhurst, Ill.

Completed tooling ring after machining. Note the adhesive bond line between the metal laminates.



(Left) — Machining a tooling ring that has been laminated from scrap tooling metal. Adhesive bonds between the metal blocks are unaffected by machining.



(Right) — Evaluating the adhesive for tooling purposes, two one-inch blocks of aluminum were bonded together and then pulled apart in a testing machine. Note how the adhesive pulled metal from the faces of both blocks.

ROSS Air Systems

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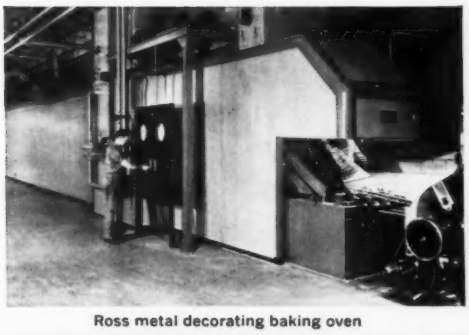
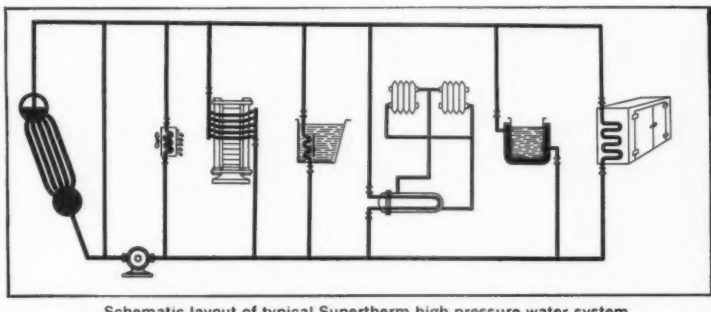


Ross metal decorating baking oven



Schematic layout of typical Supertherm high pressure water system to replace uneconomical existing process and comfort heat system

Ross foam rubber curing oven

Modernization

...THE ANTIDOTE FOR A POISON AFFLICTING MANY COMPANIES

The poison? Obsolescence! The use of a machine that is past its 'point of no return' may not show up too strongly in your unit cost structure now but its cumulative effect is devastating. It's slow poison...slowly sapping the production strength of the user. The longer an obsolete unit remains in service the greater is the unit cost gap between the old and what a modern unit would do. If you have obsolete equipment you are in a slowly deteriorating competitive position.

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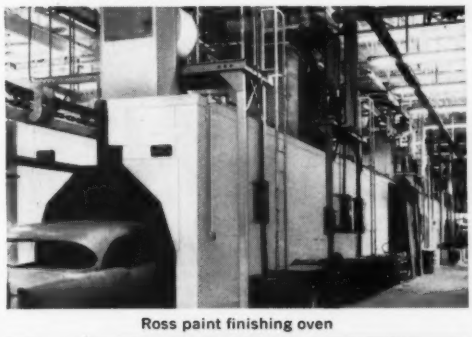
Why not check all operations in your plant that directly or indirectly involve what we call the 'Engineered Atmosphere'? Ask a Ross Specialist to make a study of the systems, equipment and auxiliary units to determine just what *is* obsolete. He will submit a detailed report as to which should be modernized to bring about the greatest reduction in unit costs. His report will be based on his broad knowledge of 'Engineered Atmospheres' and years of experience in designing the equipment and systems noted in the accompanying list.

Ross-Briner economizer; aluminum construction for roof installation



Ross paint finishing oven

Resin core stock oven

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New roll coater line for finishing metal strip

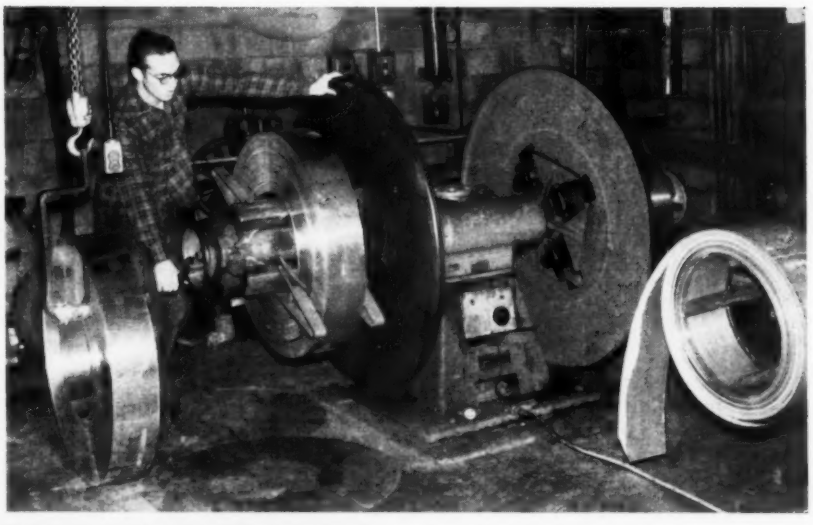
changeover of equipment by pioneer finisher of painted strip greatly increases capacity

AN MPM STAFF FEATURE

MPM EXCLUSIVE FEATURE

Production of pre-painted metal coil is definitely in the growth industry category. Though not a new process, roll coating has come of age. Improvements in finishes and methods of forming pre-coated metal have opened the way for many new products made from pre-painted stock.

Roll Coater, Inc., Pendleton, Ind., has been in the business of pre-painting metal coil since 1952. This makes the company one of the oldest in the field. The company's compact operation is scheduled to run 24 hours a day for a five-day week. Practically all of the original equipment was replaced recently to increase production capacity and operating efficiency.



Straight line production

The original equipment has been retained, and it is planned to use this to install a second production line to supplement the output of the new equipment.

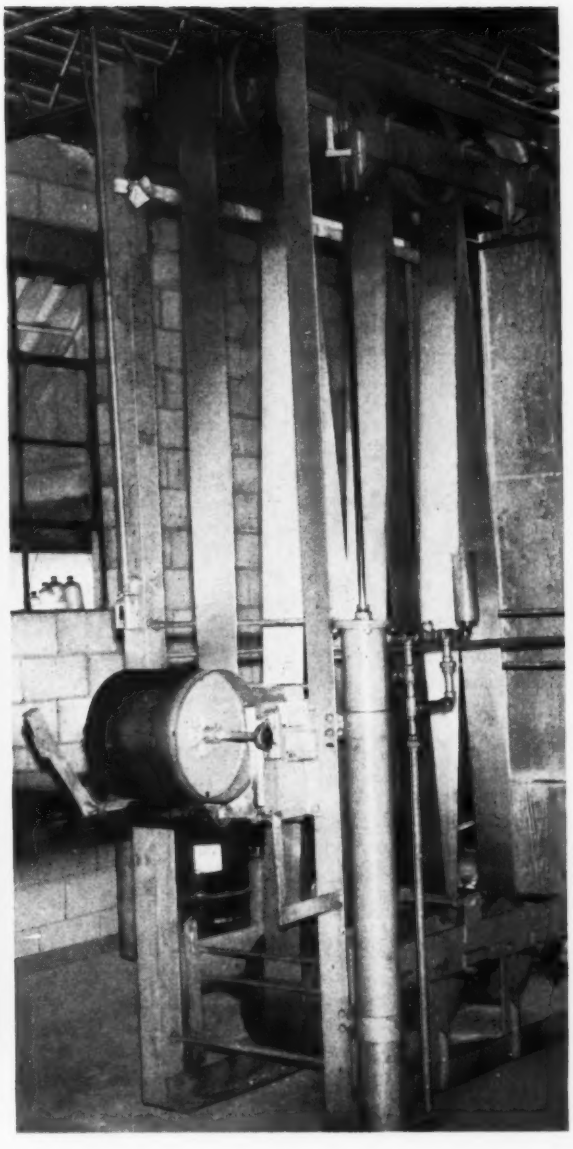
Aluminum and cold rolled steel are the metals most frequently painted. Some zinc alloy steel has been painted, and some stainless steel has been coated experimentally. The width of the strip coated on the new line ranges from four to 16 inches, and the gauges range from .008 to .062 inches for aluminum and .008 and .047 for cold rolled steel.

Operator tightening coil of aluminum on one side of double-end coil dewinder. The coil being tightened is in readiness for the other side of the dewinder, which is feeding strip into the finishing line. The divider is mounted on a swivel base to move the new strip into position. Coil at right is the "night strip" which is used when the line is shut down on weekends.

Two rolls are used to coat the strip. The coating roll presses the strip against the backup roll shown at the right. The roll at left is the pickup or "doctor" roll. It keeps the applicator roll coated with paint.

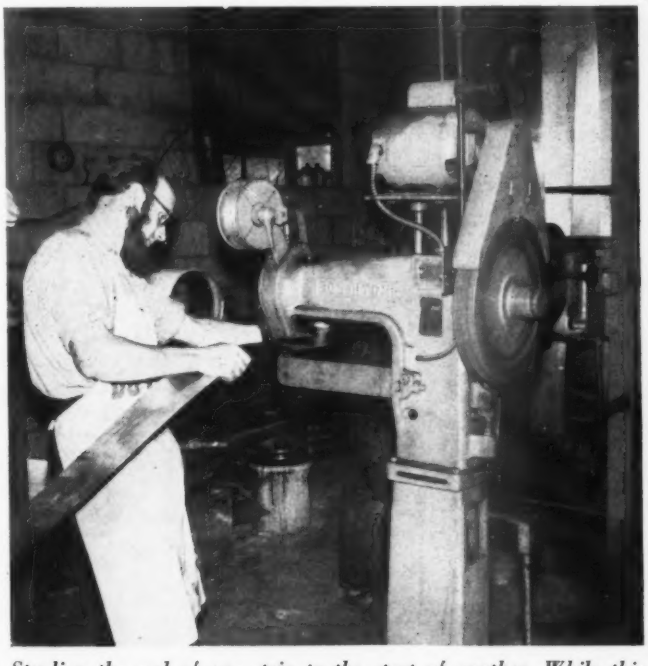
The entire line, from de-winding to winding the finished coil, measures approximately 185 feet. Only one original piece of equipment, the accumulator, remains in the new line. The accumulator allows the strip to continue without interruption through finishing while a new strip is being stapled to the strip being processed.

At the start of the finishing operation, the workman in charge of the feed end of the line puts the coil de-winder into operation and starts the accumulator, to allow him to staple the "night strip" to the coil to be finished. The "night strip" is a dummy strip of cold rolled steel that is used to bring a raw production strip through the line when starting on Monday morning. The nite strip is used any time the machine is stopped for color or roll change.



The accumulator is shown in the center of this view. A new accumulator will have nine instead of seven rolls, to give greater line speed.

EXCLUSIVE MPM PHOTOS



Stapling the end of one strip to the start of another. While this is being done, the accumulator is rising to provide a continuous feed into the finishing line.

The de-winding machine is a dual unit handling two coils. It enables uninterrupted production by moving another strip into position when the strip being processed ends, or when a warped strip prevents uniform painting. If a warped strip is encountered, the roll coater operator tells the de-winder operator and he immediately cuts the strip and staples a new one to the strip in process.

Metal preparation consists of three steps for aluminum and four for steel. Basically, each metal receives the same treatment, except that steel is treated with a phosphate coating, and aluminum is treated with a chromate conversion coating after being cleaned in the alkali cleaner.

The enclosures of the continuous spray cleaning equipment are fabricated of stainless steel, and measure ten feet in height by three feet in width. The length of each varies, depending upon the stage. For the cleaner tank, including the rinse stage, the length is seven feet; for the phosphatizing tank, the length is nine feet; the tank for etching the surface of the aluminum measures seven feet.

To achieve the best results in metal preparation, the solutions are sprayed onto the strip as it loops between idler rolls set at the top and bottom of each enclosure. All of the chemical solutions and water rinses are re-circulated, except the final rinse. The final rinse is drained into the preceding rinse tank to keep the final rinse as clean as possible.

How solutions are applied

Metal preparation solutions and rinses are applied by spray nozzles mounted on both walls of the spray enclosures. The strip enters the first enclosure at the top, travels over an idler roll at this level, and then moves down to an idler roll near the bottom of the enclosure. From this roller, the strip moves upward to a roller located at the same level as the first roll. In this manner, the strip is sent through each cycle in metal preparation in a series of loops.

One loop is made through each of the rinse stages following cleaning, phosphatizing, or surface preparation (in the

The metal preparation line. The first unit contains cleaner, the second, aluminum preparation bath, and the third, phosphatizing for steel. Note the exposed bearings for the idler rolls that carry the strip loop-wise through metal preparation.

case of aluminum). Between each of the tanks, and following the final rinse, the strip is squeegeed between rubber-covered rolls to prevent contamination of succeeding stages.

Five rolls are used in the phosphatizing stage to allow the strip to make three loops past three banks of spray nozzles. Standard solutions of phosphate compounds are used for depositing a layer of iron phosphate on the strip. One loop is made past water rinse nozzles after phosphatizing.

In the aluminum surface treatment cycle, three loops are made between two spray nozzles. No rinse is necessary after aluminum surface treatment.

Natural gas is used for fuel, and heating of each tank is completely automatic. The final rinse solution is heated to a temperature of 150° F., primarily to hasten dry-off.

All strip is passed through a ten-foot high drying tower, in a single loop, prior to entering the coater. The temperature of drying is maintained at 100°F.

Two water conditioners are utilized to maintain all rinse water at zero hardness. An interesting aspect of the water system is that waste rinse water is used to cool the hydraulic drive that feeds the strip through the finishing operation.

Paints changed "on the go"

Two idler rolls, with a large tensioner roll in between, are the first rolls that the strip passes in the roll-coating machine before being coated. The tension roll serves to keep the strip pulled taut from the roll coating operation to the winding of the finished strip.

Coating is done by a pickup roll and a coating roll. Paint is kept in a trough from which the pickup roll feeds the paint to the coating roll. The strip bears against a backup roll while it is being coated. Two sets of identical rolls are installed, one above the other at this point. This makes it possible to switch from one color of paint to another without stopping the line. Switching from one paint to another "on the go" is done by setting up the alternate paint in a trough and then manually shifting from one set of application rolls to the other.

The reverse side of the strip is coated by allowing it to ride over a set of application rolls. No backup roll is needed here, since pressure is provided by gravity and by a pair of rollers that ride against the edge of the strip at an angle. These rollers are set at such an angle that no damage is done to the freshly-applied finish.

Separate colors on each side

It is possible to apply a second color to the reverse side of the strip with no mixing of the wet finishes. Often a clear protective coating or drawing lubricant is applied to the reverse side of the strip.

The paint being used is supplied from a five-gallon container that has a metering tube set to deliver the paint according to the paint type and the rate at which the finish is being applied.

Check paint viscosity regularly

All paints are checked for viscosity every half hour. All painted strip is coated to customer requirements as to film thickness, hardness, etc. Viscosity is maintained at the point which experience has shown will give the best results.

The type paint used depends on desired finished product specifications, and is tailored to the job. All types are used, including alkyds, vinyls, vinyl-alkyd, epoxies, and plastisols.

All paint is delivered to the plant in 55-gallon drums. Since the paint is stored in the center of the plant, and the operation is on a 24-hour basis, there is no need for heating the paint in storage. A specific paint, when scheduled for use, is readied at least an hour before it is needed. Viscosity adjustments are made by thinning to manufacturer's instructions, and then the paint is agitated until the drum is emptied.

Normal speed of the line is 80 feet

EXCLUSIVE MPM PHOTOS

Removing the strip from the winder. A tandem set of winders is used to keep the strip winding at all times.

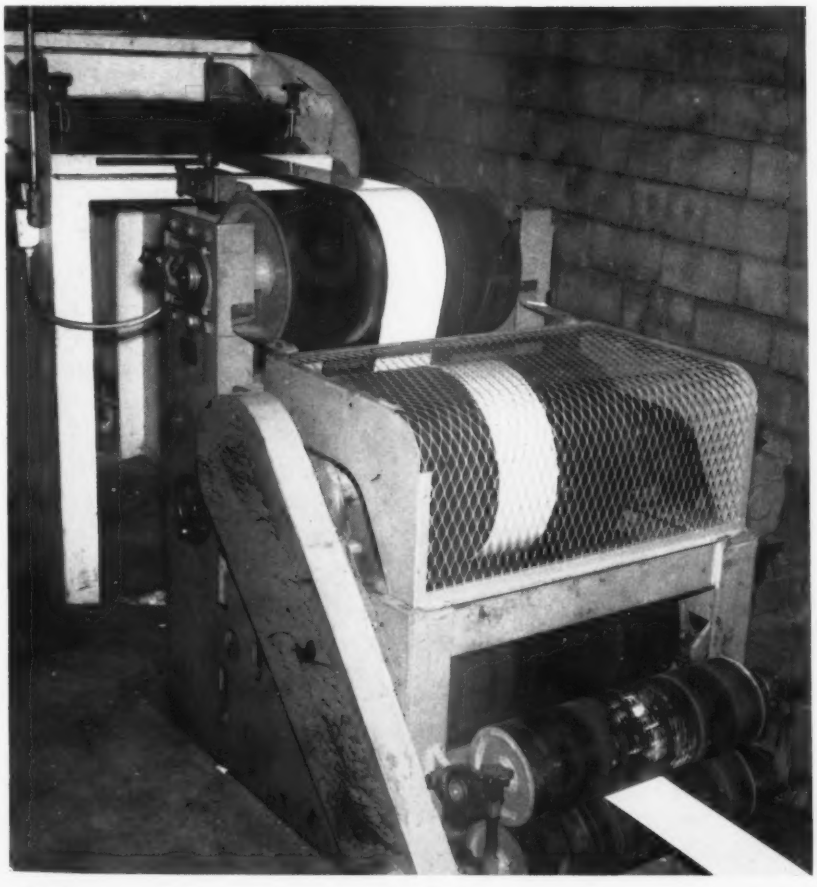
per minute. It can be speeded up to 97 feet per minute or slowed to 60 feet, depending on requirements.

Ten-zone, eighty-foot oven

From the tensioner roll in the coater to the water quenching device at the exit end of the oven, the strip is held taut to within two inches of horizontal by the tensioner roll and the drive roll at the end of the line. This distance is approximately 86 feet. A ten-hp motor provides the power for the drive roll.

The oven, a gas-fired convection type, is divided into ten zones, each with its own temperature control. The first ten feet suffice for flash-off, and then the temperature builds up from 230° F. in the first zone to 575° F. in the next to the last zone in increments of 70, 100, 75, 60, 30, 10, and then is reduced 50° F. in the last zone before the strip leaves the oven. Of course, this temperature is only typical of a wide variety of combinations possible in the oven, which measures four feet in height by three feet in width, including space for heating duct work in the lower 18 inches of the oven.

As soon as the strip leaves the oven, it is quenched with water and squeegeed between a pair of rubber rolls. Then it passes between a tracking device to keep it moving in a set path into the winders.



A tandem set of winders is used to keep the coil winding constantly. When the proper length is wound, an operator cuts the strip and shifts it to the second winder.

The coil is then removed, weighed, and wrapped for shipment. A special, automatic data processing card, in duplicate, is stamped with the weight of the coil and the customer's order number. One of the cards is fastened to the coil for the customer's information and the other is retained by Roll Coater for accounting purposes.

All strip is checked carefully to insure that it meets company standards of quality. For example, for hardness

to Page 70 →

(Above) — The entrance end of the roll coater. The top applicator rolls are being used here. By placing a trough in the lower part of the machine and shifting from the top to the bottom rolls, the color can be changed while the line is running. The actual shift is made manually by means of levers at the side of the machine.

(Left) — The drive roll assembly. The drive roll is powered by a 10-hp motor that provides motive power for the entire line.

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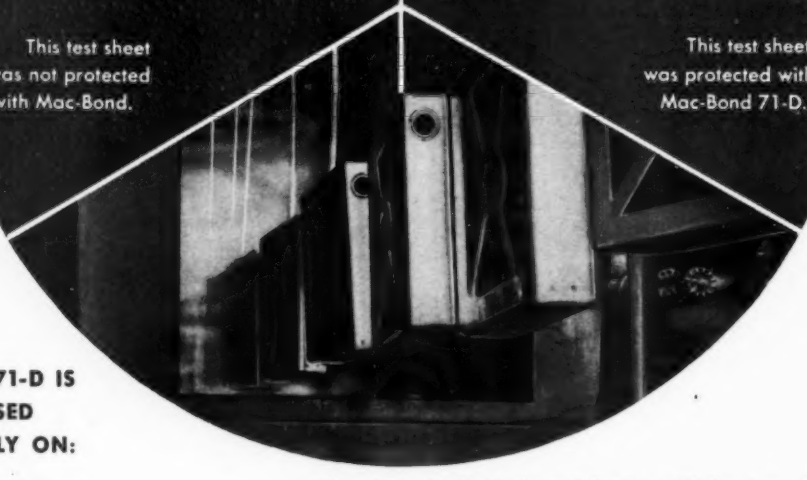

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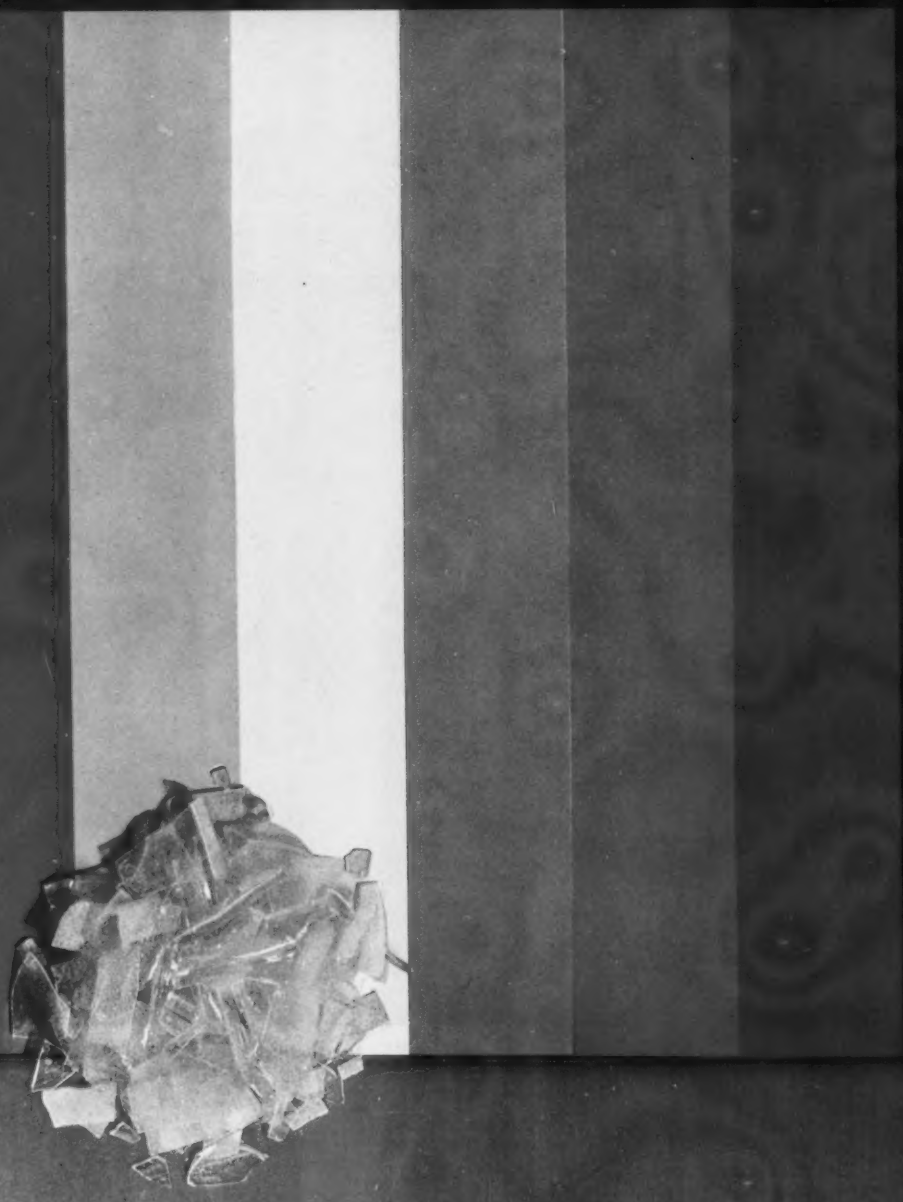

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Ferro technicians now make it easier for aluminum fabricators and enamelers to assure their customers of uniform colors on production runs — and to simplify color-matching problems.

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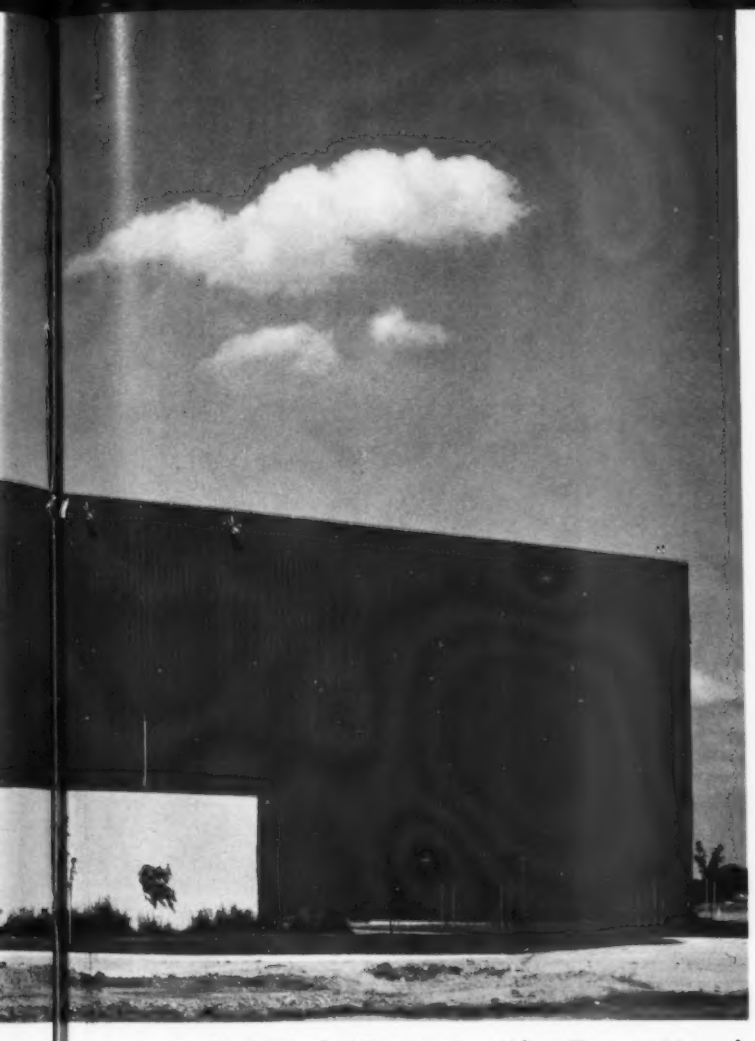

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physicists, chemists and ceramic engineers — are all at your service to help you solve any problems you have in aluminum porcelain enamels.

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Ferro's new "flake" frit has greater uniformity, and is far simpler to handle in production.

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"Flake" frit produces enamels easier to hold in suspension in the slip stage. They hold up well in storage — reduce problems frequently caused by "aging" of milled enamels.

Ferro research has also developed new techniques for using new types of mill-addition agents. Dry agents, such as sodium silicate, boric acid, and certain *wet* agents, provide greater flexibility and accuracy in tailoring enamels for specific aluminum applications: overcoming local plant problems: holding colors constant in production.

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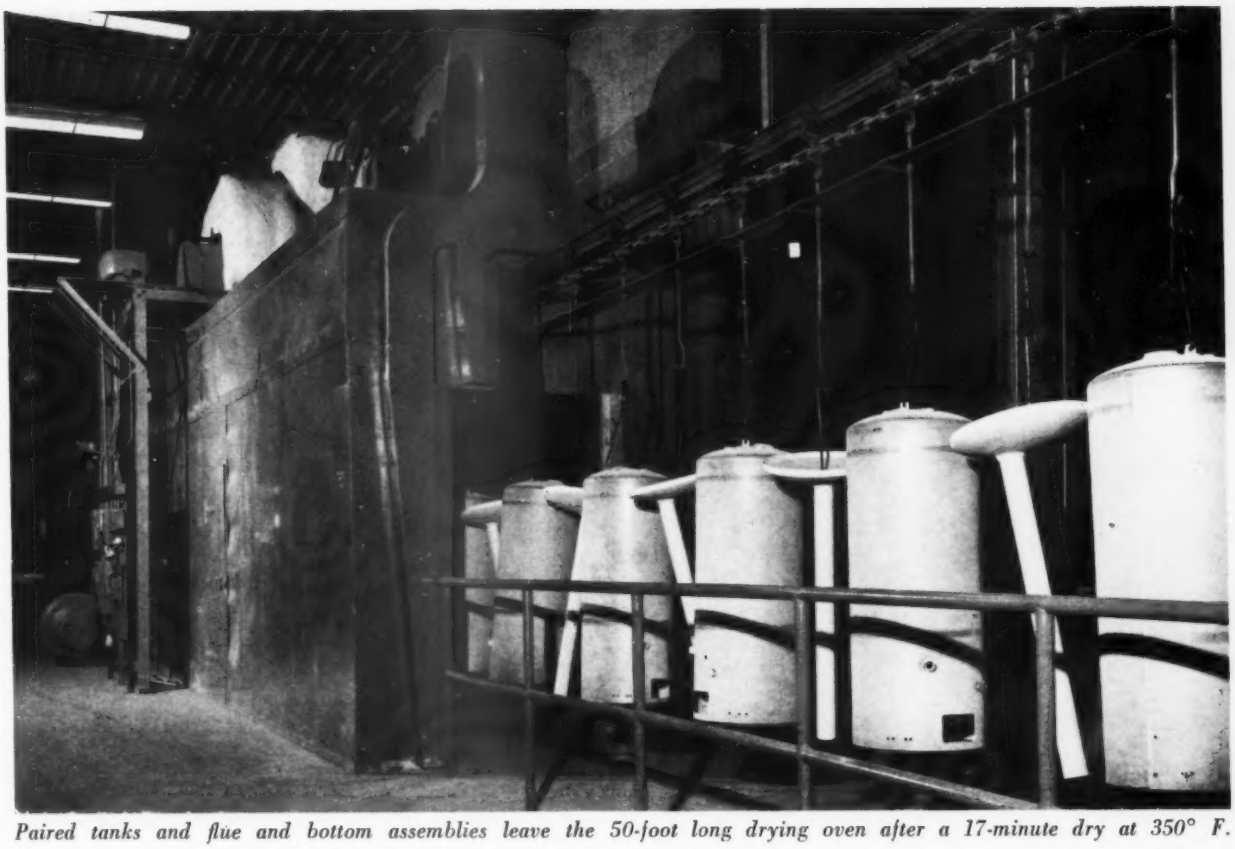


Paired tanks and flue and bottom assemblies leave the 50-foot long drying oven after a 17-minute dry at 350° F.

Glass lining water heater tanks at Republic-Odin

seven-man porcelain enameling line produces five hundred glass lined tanks per eight-hour shift

AN MPM STAFF FEATURE

MPM EXCLUSIVE FEATURE

A THUMBNAIL DESCRIPTION of the enameling department at the Los Angeles plant of Republic-Odin Appliance Corporation, where water heater tanks are given a homogeneous glass lining, could be very brief and would go something like this. . . . . "An enameling department folded upon itself to minimize material handling, reduce space requirements, and utilize available space to the best advantage."

While laying out their new Los Angeles plant, which was put into operation last August, Republic-Odin plant officials decided that the best location for the two fabrication lines, one for water heater tanks, the other for jackets and miscellaneous parts, was to parallel them from the rear end of the building (nearest raw stock storage) down its middle to its approximate center. In this way, the finished tanks and flue and bottom assemblies ended up near the center of the plant's production area.

To minimize long distance in-process handling, it was decided to start the enameling line at this point. The first leg of the enameling line then extends back toward the rear of the building, paralleling the tank fabrication line. At the rear, the line makes a complete U-turn, returning the tanks and flue assemblies through the furnace, and ultimately delivering them to within a few feet of where the enameling line originally started. The result of this layout is to compress the enameling department into one corner of the building where it will not interfere with either the fabrication, closing, or final assembly lines. It also places the massive drying oven and furnace in an otherwise unused corner of the plant area where their bulk will not interfere with other operations.

The general layout thus consists of cleaning facilities, spraying facilities,

At the start of the enameling line, both the tanks and flue and bottom assemblies are paired, then blasted clean in these Rotoblast units. (Inset shows mechanized parts holder.)

and drying oven on one leg of the "U," while the second leg contains the furnace, inspection facilities, and storage space for the enameled tanks immediately adjacent to the tank closing and tapping department.

As might be expected because of the recent installation, facilities along the Republic-Odin enameling line are all of modern design. As already noted, the tanks and flue and bottom assemblies are delivered from their respective fabrication lines directly into the starting area of the enameling line. At this point, one tank and one flue and bottom assembly (which will remain paired throughout the enameling and closing cycles) are selected and placed on a mechanized holder in one of two roto blast units. This mechanized holder rotates the parts while they are being blasted to assure even cleaning all around. A diamond-type grit is used in the roto blast units.

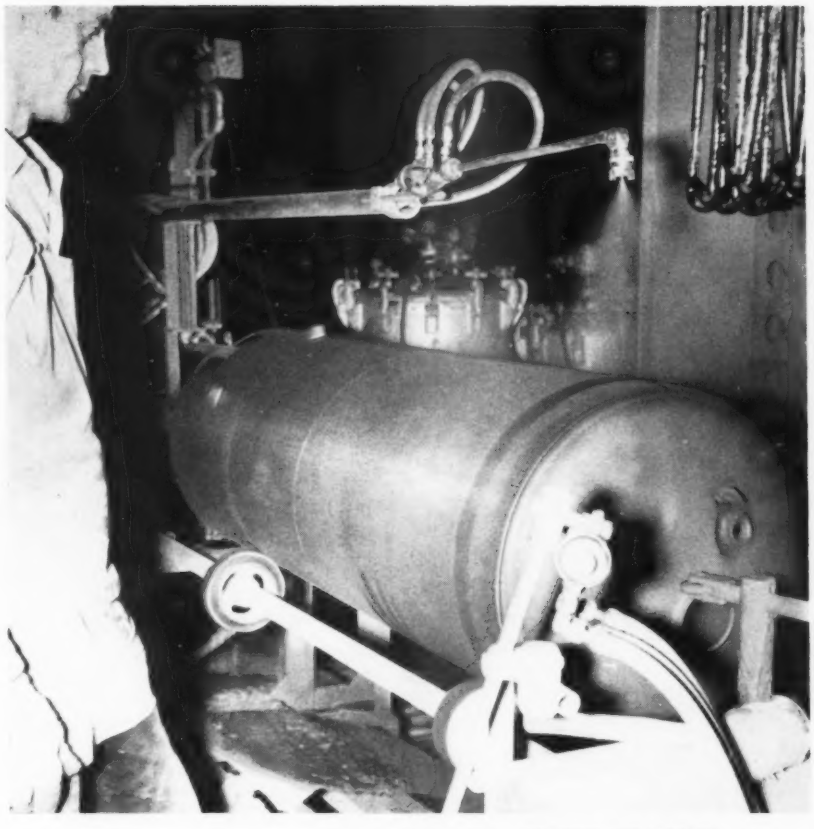
When the parts emerge from the blasting machines, they are hung on a conveyor leading directly to the spray booths. The hangers on the conveyor carrying the flue and bottom assemblies rotate when they enter the spray booth to facilitate even hand spraying of the slip on all surfaces.

The tanks are then removed from their conveyor and placed on the mechanized table of a reciprocating automatic spray machine for interior application of the slip.

The automatic spray machine has three spray heads, one for coating the tank interior, one for coating exterior sides, and one for coating the tank top. Tank rotates on spray machine table while the interior spray head and exterior side spray head move automatically the length of the tank and back. Meanwhile, the spray head at the end of the tank sprays the top exterior. This machine is electronically controlled to maintain correct coating thicknesses. In other words, the spraying heads are automatically timed so that the correct amount of slip is applied.

The frit is ground for approximately four and one-half hours, using high density balls, until it is of a fineness represented by seven to nine grams residue on a 200-mesh screen. It is then run through a magnetic separator, and the slip prepared in a 150-gallon storage

One 300- and one 500-pound ball mill, using high-density balls, is used for frit grinding to a fineness of between seven to nine grams residue on a 200-mesh screen. The slip is then passed through a magnetic separator and prepared on a 150-gallon slip storage tank for line useage.



Fully automatic machine sprays slip on tank interior, exterior, and top in a single operation. Even coating thickness is assured by electronic control.

loaded in an area directly adjacent to the twin welders used for closing. One of these welders joins the pressed-in bottom to the tank proper; the other joins the top of the flue to the top of the tank. The completely-assembled and glass lined tank, after testing and tapping, is then ready for final assembly.

Compressing this enameling line into one corner of the plant area in no way interferes with ample free working space as, on the line proper, only spray booth and inspection personnel are required. As the enameling line enters from, and empties into, a relatively-large storage area, and because handling involves only the loading and unloading of the conveyor, space is no problem under ordinary conditions.

Despite its compactness, the Republic-Odin enameling line has a potential capacity of 500 tanks in an eight-hour shift — this despite the fact that an average of only seven employees work along the line.

For flow diagram of the Republic-Odin enameling line, see next page.

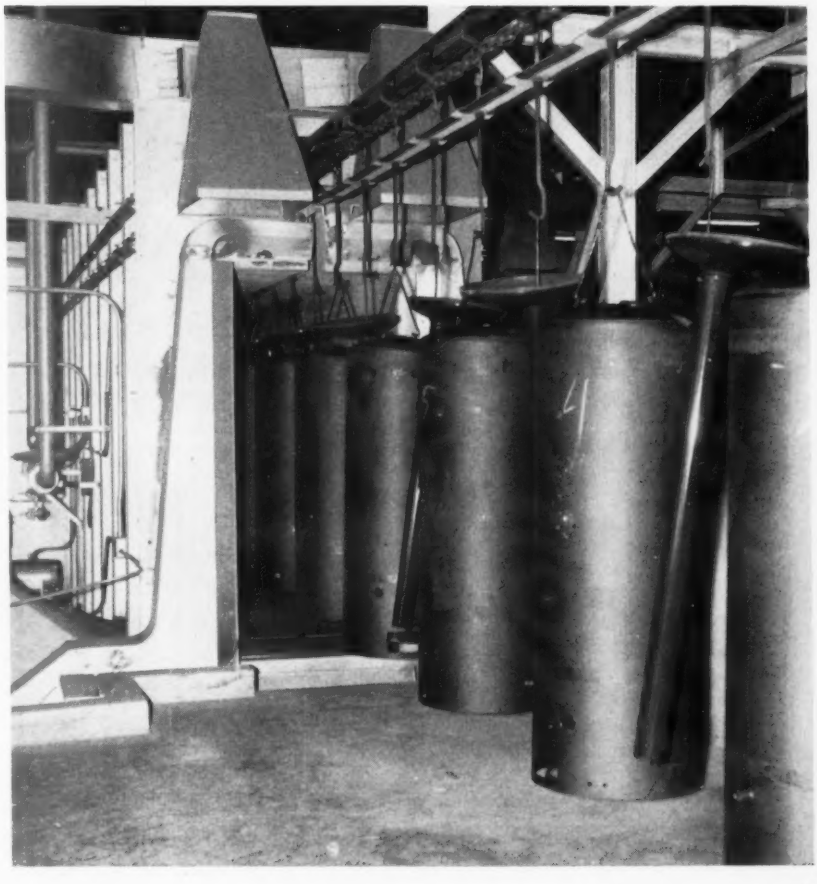
EXCLUSIVE MPM PHOTOS

tank located in the mill room. Containers for spray booths are filled directly from this tank.

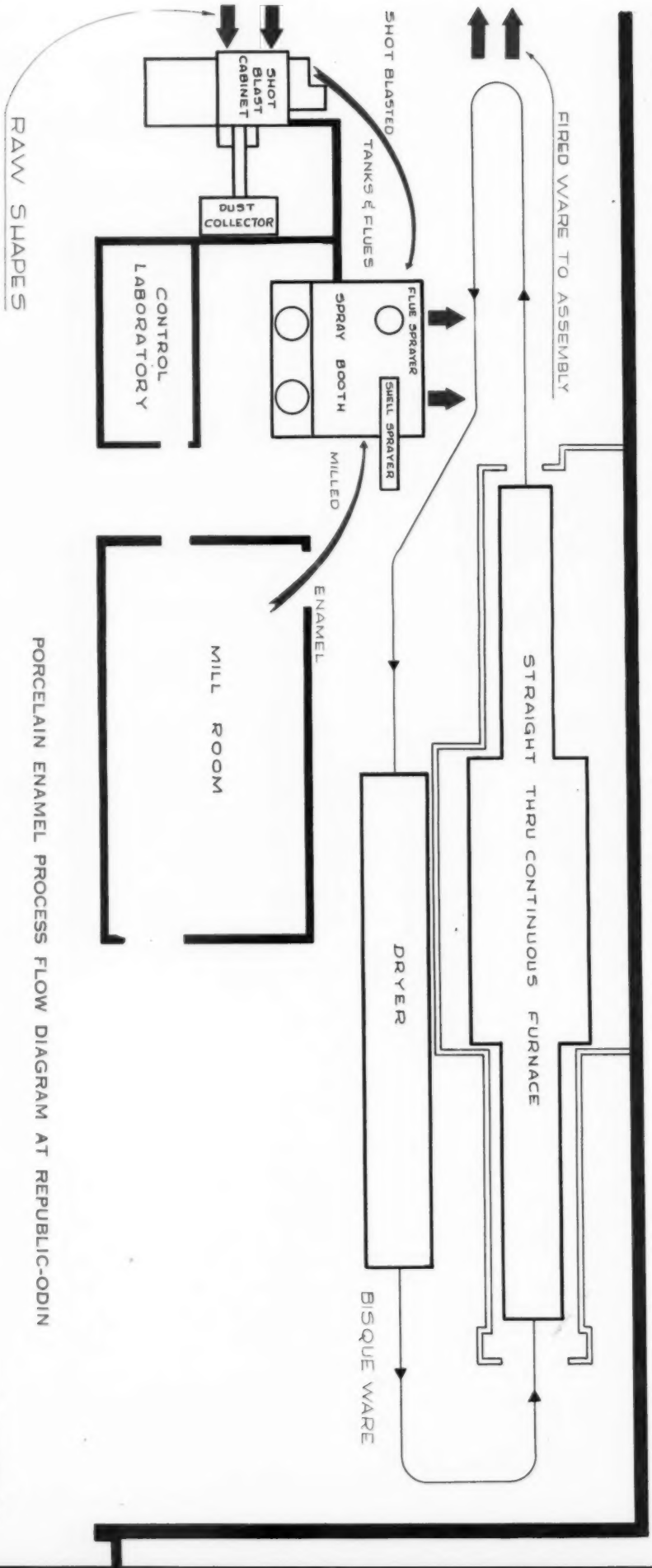
Beyond the spray booths, the parts are hung in pairs on the furnace chain. They travel first through a 50-foot long drying oven operated at 350 degrees F. Drying time is approxmately 17 minutes. Beyond the oven, the conveyor makes a complete U-turn and enters the 30-foot long pre-heat zone of the enameling furnace, then passes onward through the 95-foot long hot zone. Firing is accomplished at 1,600-1,650 degrees F. Both the drying oven and furnace are gas-fired, and continuous charting of firing temperature is accomplished by the automatic furnace heat-control unit.

The drying oven has its own burner installation, and does not employ heat from the furnace.

When the fired components leave the furnace, they continue onward through an inspection station. Here, the interior of each tank, and the exterior of the flue and bottom assembly, is visually checked for coating flaws. Beyond the inspection station, the parts are un-



Glass lined tanks and flue and bottom assemblies leave the 125-foot continuous enameling furnace and journey toward the inspection station, adjacent to the closing department.



PORCELAIN ENAMEL PROCESS FLOW DIAGRAM AT REPUBLIC-ODIN

DRAWING COURTESY FERRO CORP.

INDUSTRY MEETINGS

REFRIGERATION RESEARCH

The Refrigeration Research Foundation's Annual Meeting, Hotels Statler Hilton and Sheraton Carlton, Washington, D. C., April 2, 3 and 4, 1959.

ARCHITECTURAL METAL

The 21st Annual Convention of the National Association of Architectural Metal Manufacturers, Monteleone Hotel, New Orleans, La., April 12-17, 1959.

PACKAGING

The American Management Association's 28th National Packaging Conference, Palmer House, Chicago, April 13-15, 1959. Concurrently, AMA National Packaging Exposition, International Amphitheatre, Chicago, April 13-17.

MECHANICAL ENGINEERS

The American Society of Mechanical Engineers' Conference, Albany, N. Y., April 29-31, 1959.

CORROSION INHIBITION

Corrosion Inhibition Symposium, sponsored by Armour Research Foundation of Illinois Institute of Technology and Chicago Section of the Electrochemical Society, Illinois Tech. Campus, Chicago, May 7, 1959.

APPLIANCES

Tenth Annual Appliance Technical Conference, sponsored by the American Institute of Electrical Engineers, Hotel Manger, Cleveland, Ohio, May 18-19.

DESIGN ENGINEERING

Fourth Annual Design Engineering Show, Convention Hall, Philadelphia, Pa., May 25-28, 1959. Concurrently, Fourth Annual Design Engineering Conference.

APPLIANCE MANUFACTURERS

Institute of Appliance Manufacturers Meeting, Cincinnati, Ohio, June 1-4, 1959.

MATERIAL HANDLING

The Material Handling Institute, Inc., Exposition of 1959, Cleveland Public Auditorium, Cleveland, Ohio, June 9-12.

INDUSTRIAL FINISHING

Fifth Industrial Finishing Exposition, sponsored by the American Electroplaters' Society, Detroit Artillery Armory, Oak Park, Mich. June 15-19, 1959.

HOME LAUNDRY

The American Home Laundry Manufacturers' Association's Annual Convention, Edgewater Beach Hotel, Chicago, June 18-19, 1959.

"WEIRKOTE® WON'T PEEL OR FLAKE—AND CAN END THE NEED FOR FURTHER CORROSION PROTECTION AFTER FABRICATION."

Q. A zinc-coated steel sheet that won't peel or flake, even under the severest fabricating stresses?

A. Precisely. Weirkote's made by a continuous process. The zinc is so integrated with the steel that even the toughest "torture" tests of fabrication leave that bonded coating intact. You can work Weirkote to the very limits of the steel itself!

Q. Our products are pretty intricate—take lots of flexing, crimping and so on. What about those hard-to-reach places?

A. Weirkote's zinc coating is so uniform—protects even the most complicated parts.

Q. So with Weirkote you bypass the need for further corrosion protection?

A. You get the picture! Think of the time, labor, space—the costly capital outlay—you save. Better steel products at far lower costs—that's Weirkote for you!

Send for free booklet that details the time-and-cost-saving advantages of skin-tight zinc-coated Weirkote. Just write Weirton Steel Company, Dept. R-2, Weirton, West Virginia.

WEIRTON STEEL COMPANY

WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

a division of

NATIONAL STEEL CORPORATION

Thirty-nine story Tishman Building has better than eight acres of curtain wall construction with each window and spandrel separated by building-high, 20-inch wide, white porcelain enameled aluminum strips... made brilliant and durable through the use of *lead*. Carson & Lundin, Architects.

LEAD Adds Brilliance on Fifth Avenue

A new addition to New York's beautiful Fifth Avenue... the Tishman Building... uses porcelain enameled aluminum to accent its vertical lines. This building is of curtain wall construction with strips of white porcelain enameled aluminum 20-inch wide running its entire height between each row of windows and spandrels. And lead is essential to the production of durable, high quality enamels for aluminum.

The high fluxing power of lead will give porcelain enamels greater brilliance and smoothness. Lead will also increase elasticity and chemical resistance of the fired enamel. Lead bearing porcelain enameled aluminum panels can be sheared, sawed, punched or drilled on the job with little or no chipping.

It will pay you to investigate the cost-saving and other advantages of lead compounds in your products. More facts are in an attractive, informative booklet called "Lead in the Ceramic Industries." Write for it today.

look ahead with LEAD

Lead Industries Association

60 East 42nd Street New York 17, N. Y.

ENAMELS
GLASS
GLAZES
COLORS
BODIES

1369

NEW

SUPPLIES & EQUIPMENT

Improved Thread-Cutting Screws

Three improved thread-cutting screws, designed for every application in every material, have been announced. Five cutting flutes on the Type "F" and "B-F" are said to reduce pressure development by 80 per cent. Type "L" is a screw developed for use in nylon, and functions as a combination thread-cutting and thread-forming screw, in that it cuts a small amount of the nylon to allow the full diameter threads to form.

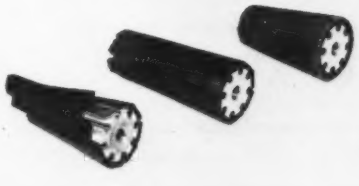
Types of screws in order of their appearance in photo are, from left: Type B-F; Type F with Sems washer; and Type L.

For further information, contact Dept. MPM, Parker-Kalon Div., General American Transportation Corp., Clifton, N. J.

Expanding-Type Abrasive Cone

An expanding-type abrasive cone has been designed to eliminate much of the abrasive waste of cone-type finishing wheels. Abrasive sleeves are retained on the wheel under virtually all grinding conditions and speeds ranging from 2,000 sfm up, according to the manufacturer. Field tests by the manufacturer show that an average of one-third more useful life can be expected from each abrasive sleeve because of this feature.

The new "Flexcone" is constructed of a machined aluminum core with individual rubber flexers at the periphery. The flexers lie flat when the cone is at rest, permitting easy placement or



removal of the abrasive sleeve. When the cone is in motion, the flexers expand and grip the abrasive so that it cannot slip or "walk" in any direction, regardless of the way the cone is moved across the workpiece.

The Flexcone is so constructed that it can be used as a hard mandrel for heavy stock removal, or as a soft mandrel for polishing. This is accomplished by using standard, snug-fitting sleeves for "hard" applications, or slightly oversize sleeves for "soft" applications.

Flexcones are available for 25-day free trial in Model 100, 1¾" x 1" x 3" long, and Model 200, 3" x 2" x 3¾" long, with ⅝-11 arbor hole, or adapter to reduce to ⅜-24 shaft.

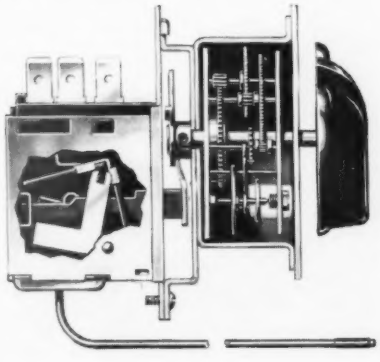
Write Dept. MPM, Nu-Matic Grinders, Inc., 8224 Carnegie Ave., Cleveland 3, Ohio, specifying type of power tool used, and whether you want medium or fine grit abrasives.

Vending Machine Control

A control for hot or cold beverage vending machines has been introduced which, it is said, will assist in complying with recent recommendations of the U. S. Sanitation Ordinance and Code for public health safety. Designated the F11 Health Code Safety Control, the unit is available for machines vending from refrigerated or heated storage compartments, and is designed to meet most State requirements now in effect.

The controls (F11-1000 Series for cold vending, and F11-1200 Series for hot vending), are semi-automatic types with manual reset mechanisms responding to temperature changes, and a mechanical spring-wound timer as a component.

Instruction Sheet 1726 may be had by writing Dept. MPM, Ranco, Inc., Columbus 1, Ohio.



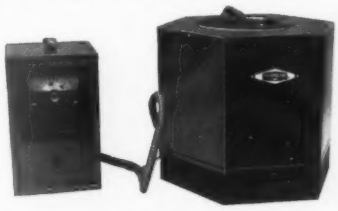
Liquid Detergent Removes Buffing Compounds

Enthol 230, a liquid detergent which removes buffing compounds, has been developed. It is said that the product effectively penetrates and dissolves hardened buffing compounds by forming soluble soaps with them. Solid abrasive particles are detached and settle to the bottom of the tank.

According to the manufacturer, Enthol 230 solutions are very effective for ultrasonic cleaning. For further information, contact Dept. MPM, Enthone, Inc., New Haven, Conn.

Electric Furnace

Said to be a completely new development in top-loading electric furnaces, the Type 2100 Thermolyne furnace is a multi-purpose unit, adaptable for use as salt bath, melting, vertical



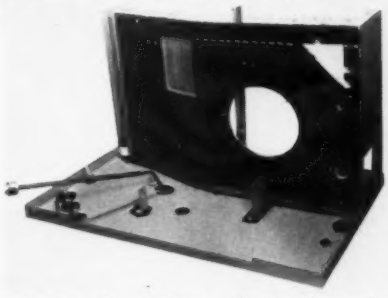
muffle, or crucible furnace. Its laboratory and shop uses encompass investigative and pilot runs, as well as short run production and heat treating of small parts. Maximum chamber temperature for intermittent operation is 1,900° F.

For further information, contact Dept. MPM, Thermo Electric Mfg. Co., 624 Huff St., Dubuque, Iowa.

Mastic Sealer

A new fire-safe mastic sealer that is self-extinguishing after the solvent has been released is identified as Presstite No. 144.7 Mastic Sealer.

Because it can be pumped, it is suited to production line installations, such as for air conditioners. Suggested air conditioner applications include: Insulation and protection of bottom pan in room-type units; Sealing of air-directing partitions; General sound deadening; Corrosion



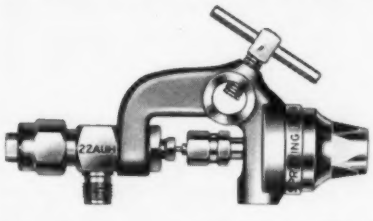
protection of projections, welded studs, annular areas, etc.; Sealing against condensate and air; Holding sound deadening pads in place; and Miscellaneous applications on dual-purpose air conditioning and heating equipment.

There are other special purpose No. 144 sealers that are fast drying, slow drying, odorless, and capable of retaining "life" while submerged under water. Other features are: resistance to breakdown caused by frequent freeze-thaw cycling; ability to span open spaces and gaps up to ¼" without slumping; and taking paint baking temperatures without "running."

Samples and technical data sheets are available on No. 144.7 Mastic Sealer, and others in the series. Address your request to Dept. MPM, Presstite-Keystone Engineering Products Co., division of American-Marietta Co., 39th and Chouteau Ave., St. Louis 10, Mo.

Automatic Spray Gun

An automatic spray gun, called AutoJet, has been introduced which, according to the manufacturer, will apply paints, lubricants, polishing and buffing compounds, and related industrial



coatings at any pressure from 400 to 2,000 psi. The pneumatically operated control valve operates at 70 to 100 pounds pressure, and is said to provide instantaneous on-and-off response to meet any production cycling need.

For further information, write for Bulletin 96, Dept. MPM, Spraying Systems Co., 3201 Randolph St., Bellwood, Ill.

Water Cooler for Steel Drums

A device for applying heating or cooling to conventional 55-gallon steel drums is now being marketed. It consists of a single-embossed coil with clamp and flexible connections to permit, according to the manufacturer, rapid change from one drum to another, or changing the location on an individual drum. Insulated handles are included.

Flexible connections can be made to steam lines, hot or cold water, or other refrigeration sources to add or withdraw heat from the contents of the barrel.

For further information, contact Dept. MPM, Platecoil Div., Tranter Mfg. Co., 735 E. Hazel St., Lansing 9, Mich.

More New Products on Page 76 →

WHITER THAN NATURE'S WHITEST

PORCELAIN ENAMEL

FRIT

If a fresh snowfall is your idea of whiteness, Hommel Tite-Wite is whiter than white . . . dazzling in its purity. With Hommel Tite-Wite, color uniformity is assured. Every bag is quality controlled, your guarantee of a perfect application every time.

The secret of Hommel whiteness is quality run materials and pioneering research. This unbeatable team also gives you these added advantages: lower production costs, versatility for drain, dip or spray application, permanent alkali and acid resistance, improved scratch and thermal shock resistance. Your local Hommel representative will be glad to show how Hommel research works for you.

Dept. MPM-459

You are welcome at the Hommel suite in the Palmer House during the Annual Meeting of the A.C.S.

THE O. HOMMEL CO. PITTSBURGH 30, PA.

West Coast Warehouse, Laboratory and Office, 4747 E. 49th Street, Los Angeles, California

POTTERY • STEEL AND CAST IRON FRIT
CERAMIC COLORS • CHEMICALS • SUPPLIES
Our Technical Staff and Samples are available to you

World's Most Complete Ceramic Supplier

NEW INDUSTRIAL LITERATURE

Vinyl Sheeting Brochure

Vinyl permanently bonded to steel, aluminum, magnesium or wood offers unlimited possibilities for restyling products with the authentic look and feel of fine fabrics or leathers, according to the manufacturer. In production it can be machined and formed on standard equipment as precisely as metal alone, it is even more damage-proof, and requires no painting than costly hand operations, asserts the manufacturer. A new brochure is available which describes laminate samples, colors and textures, test specifications and industrial applications. For the free booklet write Dept. MM-359, Columbus Coated Fabrics Corp., Columbus 16, Ohio.

Self-Extinguishing Mastic Sealer

A manufacturer of industrial sealants has announced a new fire-safe mastic sealer that is self-extinguishing after the solvent has been released. This material is pumpable and is said to be well suited to fast-production-line installations as, for example, in air conditioner sealing. Typical applications in this area include: insulation and protection of bottom pan in room-type air conditioning units, sealing of air-directing partitions, and general sound deadening. There are other sealers in this line with a variety of characteristics to meet the number of kinds of special application requirements. Samples and technical data sheets are available on request. Contact Dept. MPM, Presstite-Keystone Engineering Products Co., 39th and Chouteau Avenues, St. Louis 10, Mo.

Chromium Plating Bulletins

A series of newly available information bulletins on barrel and rack chromium plating of small parts has been prepared for free distribution. Included in the series is an illustrated bulletin on the firm's services and facilities; and technical progress reports. The latter is planned to be a regularly published report, suitable for the idea files of those responsible for buying metal finishing. Each issue is said to be planned to point out the progress and improvements in electroplating that result from the equipment and procedures of this company. Also included are illustrations and description of services for burnishing, testing, laboratory work and research. For the bulletins and reports contact Dept. MPM, Whyco Chromium Company, Inc., Thomaston, Conn.

Lighting Indicator Unit

A data sheet has been issued which illustrates the No. 101N-022 Indicator Light with built-in 22,000-ohm resistor. The manufacturer states that the advantages of neon can be efficiently used for indicator lights. The lamp is said to be about twenty times brighter than old style neons.

For a copy of the data sheet, write Dept. MPM, Drake Mfg. Co., 1711 W. Hubbard St., Chicago 22, Ill.

Booklet On Welding Nuts

Using welding nuts to best advantage is the topic of a new, free illustrated booklet. Conceived as a guide to designers, it is reported that the booklet demonstrates the many ways in which welding nuts save time and labor in both fabricating and assembly, while they simplify the fastener access problems so often encountered in modern designs. For the free booklet, write Dept. MPM, Mildand-Ross Corp., Owosso Div., Owosso, Mich.

Aluminum Design Data

A booklet is available which is said to go a step beyond the formal specification data. The company offering the bulletin would like to know all about the exact product to be fabricated. This company has had a number of years of experience in supplying aluminum for such diversified products as saucepans and awnings, bottle caps and chemical equipment, storm doors and fan blades. For a free copy of this latest technical bulletin which describes products, availabilities and design data, write Dept. P-8, Fairmont Aluminum Co., Fairmont, W. Va.

Stainless Steel Information

Stainless steel can be used for trim and bright work since it has the strength to withstand the abuse of every day use, according to the manufacturer. It is also said to provide maximum resistance to denting and scratching. Stainless steel reportedly can be used for functional parts because its strength, heat resistance and corrosion resistance make it the metal for any application involving heat or cold. For additional information on stainless steel contact Dept. MG-6992. Republic Steel Corp., 1441 Republic Bldg., Cleveland 1, Ohio.

Aluminum Preparation Bulletin

A bulletin is available describing specific applications of Amchem Alodine. The booklet contains a selection chart to help choose the Alodine type suited to individual needs. This aluminum preparation forms an amorphous coating on aluminum, insuring its corrosion resistance and guaranteeing a tenacious bond for paint, according to the manufacturer. It is said to be simply used, low in cost and highly efficient in its protective nature. Write for bulletin 1424A, Dept. MPM, Amchem Products, Inc., Ambler 21, Pa.

New Timer Automates Finishing

A new type "memory timer" is said to automatically sense product shape, size and location on the conveyor and relay this information to automatic spray guns. The spray guns operate only when each product is in precise position. No material is reportedly wasted spraying cut out areas or irregular configurations. These electro-mechanical timers are said to be rugged and dependable and, they are adaptable to most rotary, horizontal or vertical spraying machines. Send for bulletin A96-1 to Dept. MPM, Binks Mfg. Co., 3122 Carroll Ave., Chicago 12, Ill.

More New Literature on Page 63 →

50 *years of results that satisfy just about everybody... except Oakite.*

And we never will be satisfied. Our goal has always been to furnish even *better* cleaning at even *lower* cost—AND IT ALWAYS WILL BE!

Sure we're proud of the hundreds of Oakite "firsts" in developing fine cleaning compounds, cost-cutting methods, time-saving mechanical equipment. But we'll never rest on pride. As soon as we find a satisfactory answer to a cleaning problem—our research starts searching for an even better one.

That's why so many users continue to rely on Oakite to reduce their "per unit" cost. They know that year after year, they are getting the best cleaning for the lowest possible cost.

OAKITE
SCIENCE
50 *1909-1959 years' leadership in industrial cleaning*

Oakite's pioneering in the future will mean what it has meant for the past 50 years: not only better products, but better service . . . better methods . . . better equipment. All deliberately designed with you in mind to give *you* the most for your cleaning dollar.

This handy guide is a distillation of 50 years of Oakite cleaning experience. It can save you valuable time—and cold cash, too—on all your cleaning operations. Send for it. Oakite Products Inc., 50A Rector Street, New York 6, N. Y.

New Literature Cont.

Isostatically Formed Grinding Balls

According to a user of high density grinding balls and lining brick for grinding porcelain enamel frits, their company has saved as much as forty-five per cent on valuable milling time, increased production as well as quality, and has saved money. These grinding balls and lining brick are made isostatically of special alumina ceramic and fired at 2670° F to a specific gravity of 3.4, according to the manufacturer. For technical information and samples of these grinding balls write Dept. MPM, Coors Porcelain Company, 600 Ninth Street, Golden, Colo.

Catalog Describes 100 Perforated Metal Designs

A free catalog is available which describes over 100 grill designs of perforated metal. The book also illustrates perforated metal screens, wedge slot screens and architectural grills. These grills are said to be low cost, always lie flat and never bend or warp. For the free booklet write Dept. MPM, Hendrick Mfg. Co., 79 Dundaff St., Carbondale, Pa.

Lead in the Ceramic Industries

An attractive and informative booklet called "Lead in the Ceramic Industries" is available. The booklet describes the cost saving and other advantages of lead compounds in various products. According to the booklet, the high fluxing power of lead will give porcelain enamels greater brilliance and smoothness. Lead also is said to increase elasticity and chemical resistance of the fired enamel. Lead bearing porcelain enameled aluminum panels reportedly can be sheared, sawed, punched or drilled on the job with little or no chipping. For the free booklet write Dept. MPM, Lead Industries Assn., 60 E. 42nd St., New York 17, New York.

Power and Free Conveyor Systems

Materials handling flexibility has reportedly been elevated to a higher degree. This has been done by a new type of trolley conveyor called "Power-and-Free." These conveyors are said to make straight line production possible even where materials are processed at varying speeds. They will transport parts to work areas, leave them there to be processed and then reclaim material from storage as needed. Cargo can be slowed down, speeded up or stopped—moved vertically, pivoted, indexed, dumped or dipped as needs dictate, according to the manufacturer. Write for Book 2330, Dept. MPM, Link-Belt Co., Prudential Plaza, Chicago 1, Ill.

Complete Metal Preparation Service

Appliance manufacturing plants can gain complete knowledge for metal preparation service by consulting a new folder on chemicals for metal preparation. Specialists survey a process, recommend chemicals to fit needs and help supervise installation and startup. These same men follow through with regular service calls to keep finishing lines running at top efficiency, according to the manufacturer. This company makes every type of metal cleaner, phosphate coating and drawing compound presently used in the industry. For the new folder on chemicals for appliance manufacturing plants contact Metal Processing Dept. 709, Pennsalt Chemicals Corp., 3 Penn Center, Philadelphia 2, Pa.

Vinyl Wrinkle Coating Uses

A five-page technical bulletin describing the use of vinyl plastisols, organosols, and solutions in the formulation of vinyl wrinkle coatings, has been released. Called "Vinyl Wrinkle Finishes," the new bulletin explains advantages and suggests formulations for using these coatings. For copies of the bulletin, write Dept MPM, Release No. 40, Union Carbide Plastics Co., 30 E. 42nd St., New York, N.Y.

Automation Machine Folder

Specifications and descriptions of a variety of "building-block" type automation machines for mechanizing and integrating production and assembly operations are now available through a product information folder. The machines described include floor feeders and orientors, rotary hoppers, self-compensating grinder controls, high speed automatic hardness testers, and electronic inspection systems for multiple dimension gaging and selective segregation of parts. For the folder, write Dept. MPM, Radio Corp. of America, Industrial & Automation Div., 12605 Arnold Ave., Detroit 39, Mich.

Aluminum Soldering Brochure

Information on the soldering of aluminum is presented in a brochure which includes data on soldering fluxes, irons, and flames, and describes soldering operations such as hot plate, dip furnace, friction, glass fiber brush, and ultrasonic operations. Types and properties of aluminum solders are also explained, plus the corrosion of soldered joints and their performance in aluminum. Copies can be obtained by writing to Box MPM, Reynolds Metals Co., Dept. PRD-6, Box 2346, Richmond Va.

Subminiature, Snap-Acting Switch

A subminiature, snap-acting switch for use where operating force is applied by a cam, as in many types of automatic equipment, is now available. According to the manufacturer, the stainless-steel roller provides long-wearing, low-friction bearing on the actuating cam, and the spring plunger permits .031-inch over-travel. The plunger is keyed to keep the roller in line with the cam. For the free catalog, write Dept. MPM, Unimax Switch Div., W. L. Maxson Corp., Ives Rd., Wallingford, Conn.

Automatic Roll Feed Catalog

A new catalog on automatic roll feeds is now available. Covered in this catalog are specifications and prices for 15 standard roll feeds and accessories. These accessories include two-piece adjustable eccentric, adjustable mounting brackets, vernier adjustment attachment, and standard, heavy, and extra heavy duty indexers. For this free catalog, write Dept. MPM, Durant Tool Co., 1 Washington Ave., Providence 5, R. I.

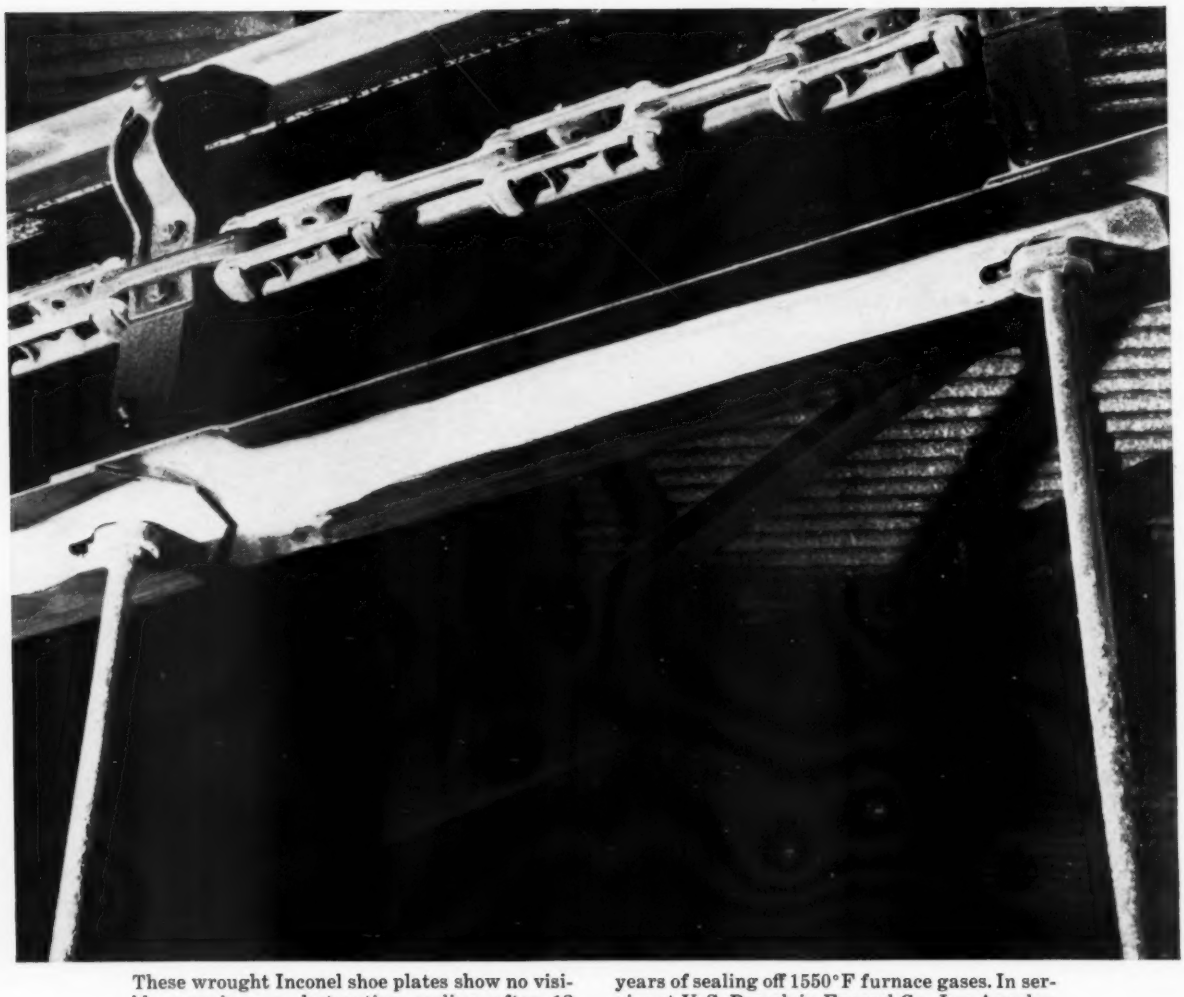
A Handy Size, Ready-Reference Handbook on Machining Aluminum

A 32-page booklet provides complete data on machining practices, tool angles and designs, and tool materials. Proper speeds, feeds, lubricants, and cutting compounds are explained fully, enabling machinists and engineers to realize the unmatched speed and ease possible in machining aluminum and its alloys.

Eight charts, clearly illustrated and supported by condensed text, cover eight major machining operations; turning, milling, shaping and planing, drilling, reaming, tapping, filing, and sawing. The text also explains grinding operations.

Copies of "Machining Aluminum" may be obtained by writing on your company letterhead to Special Projects Editor, MPM, York St. at Park Ave., Elmhurst, Ill.

More New Products on Page 76 →



These wrought Inconel shoe plates show no visible warping or destructive scaling after 12 years of sealing off 1550°F furnace gases. In service at U. S. Porcelain Enamel Co., Los Angeles.

Inconel shoe plates keep the lid on 1550°F furnace heat for 12 years

... no warping or destructive scaling visible

See the Inconel* nickel-chromium alloy shoe plates above? Notice how straight, how scale-free they are? And how little they've worn down?

These wrought Inconel shoe plates seal in 1550°F in a straight-through enamelling furnace. They've been moving along a furnace top for 12 years . . . and it looks like they're good for many more.

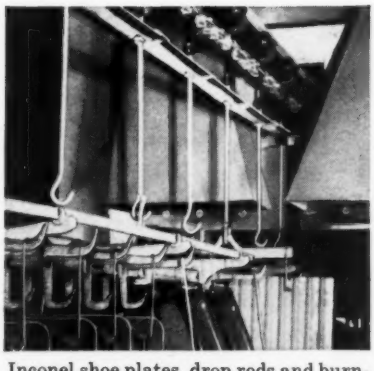
Inconel alloy gives outstanding service in other hot spots in the 1550°F furnace.

For instance: wrought Inconel drop rods are holding up well after 6 years . . . last 2 to 3 times longer than rods of other materials.

For hanging ware from coat hangers, Inconel 10" burning hooks are bent in the shop from 3/32" dia. rod. At furnace temperatures, they retain their strength and form a tightly adhering scale that doesn't flake off to spoil ware.

Want more information on how Inconel shoe plates, Inconel burning tools, can lower your shop costs? Just write Inco. *Registered trademark

The International Nickel Company, Inc.
67 Wall Street New York 5, N. Y.



Inconel shoe plates, drop rods and burning hooks give long service at U. S. Porcelain Enamel.

INCO NICKEL ALLOYS

2,000,000 POUNDS SOLD

A PROGRESS REPORT ON PEMCO LOW TEMPERATURE (1400°) FRITS

Still new . . . but proven by a year in use! Recently Pemco passed a milestone by shipping the 2,000,000th pound of low temperature (1400°) enamel frit, a product offering many unusual advantages in a wide range of uses.

Pemco has devoted years of Research and Development to such a product. Climax of the work came in April of 1957, when the first frit of this type was put into use by customers. By early 1958, Pemco had created a whole family of low temperature materials offering these advantages:

Low stress-low warp . . . Low stress features that cut warpage on flat areas.

Low rejects . . . Not only do low stress enamels reduce warping, but chipping and spalling is also held to a minimum.

Savings in steel . . . Because of reduction in warpage, panels of lighter gauge cold rolled steel can be substituted for heavier gauge enameling iron. The pound and dollar savings of steel that result can be considerable.

Resistance to acids and alkalis make this series of frits ideal for such products as home laundry equipment. Other uses include refrigerator liners, range parts, architectural panels, fluorescent reflectors, etc. While 1400° low temperature frits are not advisable for all uses, a study of their characteristics and performance may suggest advantages for use in your operation. Write today for reprint of an article on the subject, especially prepared by Pemco's Service Department.

RESEARCH AND A FLAME

PEMCO

Ceramic frits, inorganic pigments, vitrifiable glass colors

BALTIMORE 24, MARYLAND

PMI tenth annual spring technical meeting

changing dies in seconds and minutes instead of hours, and a review of experiments with explosive forming, were among the many subjects covered for the metal stampers

AN MPM PRESSTIME STAFF REPORT

THE TENTH ANNUAL Spring Technical Meeting of the Pressed Metal Institute was held March 11, 12 and 13 at the Pick-Congress Hotel, Chicago. Carter C. Higgins, Wooster Pressed Steel, is National president. PMI officials set the opening day attendance at 450, an all time high. Harold A. Daschner, PMI managing director, reported good attendance from Canada as well as from all sections of the U. S.

The morning session of the first day was headed "Cost Saving Die Ideas" but included many time and money saving ideas not indicated by the title. Speakers included Stanley R. Cope, president, Acme School of Die Design Engineering; Aldo L. Coen, president, Alpha Products, Inc.; W. J. Kirsch, safety supervisor, Standard Control Division, Westinghouse Electric Corporation; and John H. Zeder, chief die engineer, The Budd Company.

Mr. Kirsch showed the system used at Westinghouse Standard Control Division for color coding all dies through the use of pressure paint spray cans. Four colors are used: green, yellow, orange and red—applied only to the front faces of the dies. Two-hand control is indicated by green; one-hand control is indicated by yellow; single-stroke operation has a color code of orange; and foot pedal or hand control, continuous operation, has the color code of red. No die can be set up for production in the Westinghouse plant that is not color coded.

W. J. KIRSCH shows example of color coding of dies, and method of guarding, with the aid of a demonstration model. Two side guards and front guard stay with die set at all times. Wing guards stay with press.

Speaker Kirsch presented seven necessary points in the development of a successful die coding program. They are: *1/ Set up the policy; 2/ Post or distribute policy; 3/ Educate and promote; 4/ Continuous checks; 5/ Inspection procedure; 6/ Safety observer; and 7/ Enforce the policy.*

Die change time reduced to seconds

The attention of all metal stampers was focused on Mr. Coen as he described a French system of "quick change" for dies which he investigated while in Europe. The speaker stressed the "down time" in this country which may run from 40 percent to as high as 80 percent on short and medium runs.

Due to different manufacturing conditions in some European countries extremely short runs are common. Coen described production in a bicycle plant (producing 100 units per day) where 74 different parts are fabricated, all in one press by one operator. Die change time runs from 20 to 25 seconds. He saw a "small girl" change a die in a French plant in 16 seconds.

In a typical layout for this system there is a conveyor on each side of the press and all dies to be used for the day in the press are placed in the conveyor system. As one hundred, or the set number of parts, are produced from each die the die moves out and the succeeding die is set.

A push button feeds the die to the press and a second push button locks it in place. With this method the ram is prefixed and there is no adjustment. Every die has the same shut height.

ALDO L. COEN describes European method of "quick die changing," using pre-setup technique and conveyors for die loading. A girl makes a small die change in France in sixteen seconds. Heavy die changes are made in minutes instead of hours.

EXCLUSIVE MPM PHOTOS

According to Mr. Coen, the same principle is now being adopted in a truck and bus plant in Italy where 500, 700 and 1000 ton presses are employed. In this case part of the system is built into the press. Dies weighing several tons are handled by button control, including dies for large fender parts. Time from the last stamping produced from one die setup to the first piece from the next die is as little as 7 minutes. Mr. Coen reports that the system is spreading rapidly in Europe due to the savings in equipment down time, storage space for finished stampings and other obvious advantages.

As readers will have anticipated, the setting of dies and all adjustments are handled in the tool room — no setup men are used. There is no tryout at the press except when the die is new. This obviously means more work in the tool room and less at the press.

A German company, Coen reports, is manufacturing equipment with the system "built in". A press with a die change time of ten minutes was estimated to cost approximately 20 percent more than a standard press of equal rating.

Work simplification

Clem Caditz of Northern Metal Products introduced Allan H. Mogensen, director Work Simplification as the featured speaker for the first day's luncheon. Mogensen's talk was very well received.

Machine mobility reviewed

Machine mobility was the subject of George McKewen's, Barry Controls Co., talk in the first session of the second day. Mr. McKewen reviewed the advantages of mounting presses on specially made pads to make the shifting of machinery from place to place, in or out of the plant, an easy task. Some of the advantages of this method of mounting presses are: 1. Cost savings in moving, 2. Elimination of drilling holes in floors, 3. Flexibility of press movement for changes in production requirements.

Multiple operation press

Charles Hautau of the Baldwin-Lima-Hamilton Corp., gave a talk on the possibilities in automating inter-press transferring. According to Mr. Hautau, it is possible to solve any problem regarding the automatic handling of parts from press to press. A different concept of press design that reportedly eliminates the problems of multiple operation presses was shown to the audience. Closely spaced presses are used to achieve automatic progressive drawing and blanking operations. The press design shown was circular, with a series of die stations arranged around the periphery of the press. Transfer of the parts from one operation to the next is done by a series of simple mechanical tongs set up to work automatically.

Present 1958 safety awards

Safety awards for 26 member companies of the PMI were presented by Philip Atwood of Neff, Kohlbusch & Bissell, PMI's Chicago District Chairman and toast master at the luncheon on the second day. The companies receiving safety awards for one year of no lost time accidents, representing a total of 11,460,387 man hours, were: Akron-Selle Co., American Metalcraft Co., Bancroft Pressed Metal Co., Inc., The Budd Co., Chicago Cutting Die Co., The Columbia Metal Stampings Co., S. W. Evans and Son, Inc., HPL Mfg. Co., August W. Holmberg & Co., Inc., Johnson-Claflin Corp., Kickhaefer Mfg. Co., Larson Tool & Stamping Co., Lenkeit Machine & Tool Co., Inc., Laminated Shim Co., Inc., New Standard Corp., The Rober Tool Corp., J. H. Sessions & Son, Superior Spinning & Stamping Co., Telmor Tool & Stamping Co., Wisconsin Tool & Stamping Co., Kolk Mfg. Co., Inc., Anger Mfg. Co., The Dickey-Grabler Co., Abalon Precision Mfg. Corp., Danby Mfg. Co., R. Krasberg & Sons Mfg. Co. Of the 26 companies winning awards there were only nine accidents, none of which resulted in lost man hours.

CARTER C. HIGGINS, national president of PMI, *welcomes largest group of metal stampers to attend the annual technical sessions.*

Explosive forming future possibility

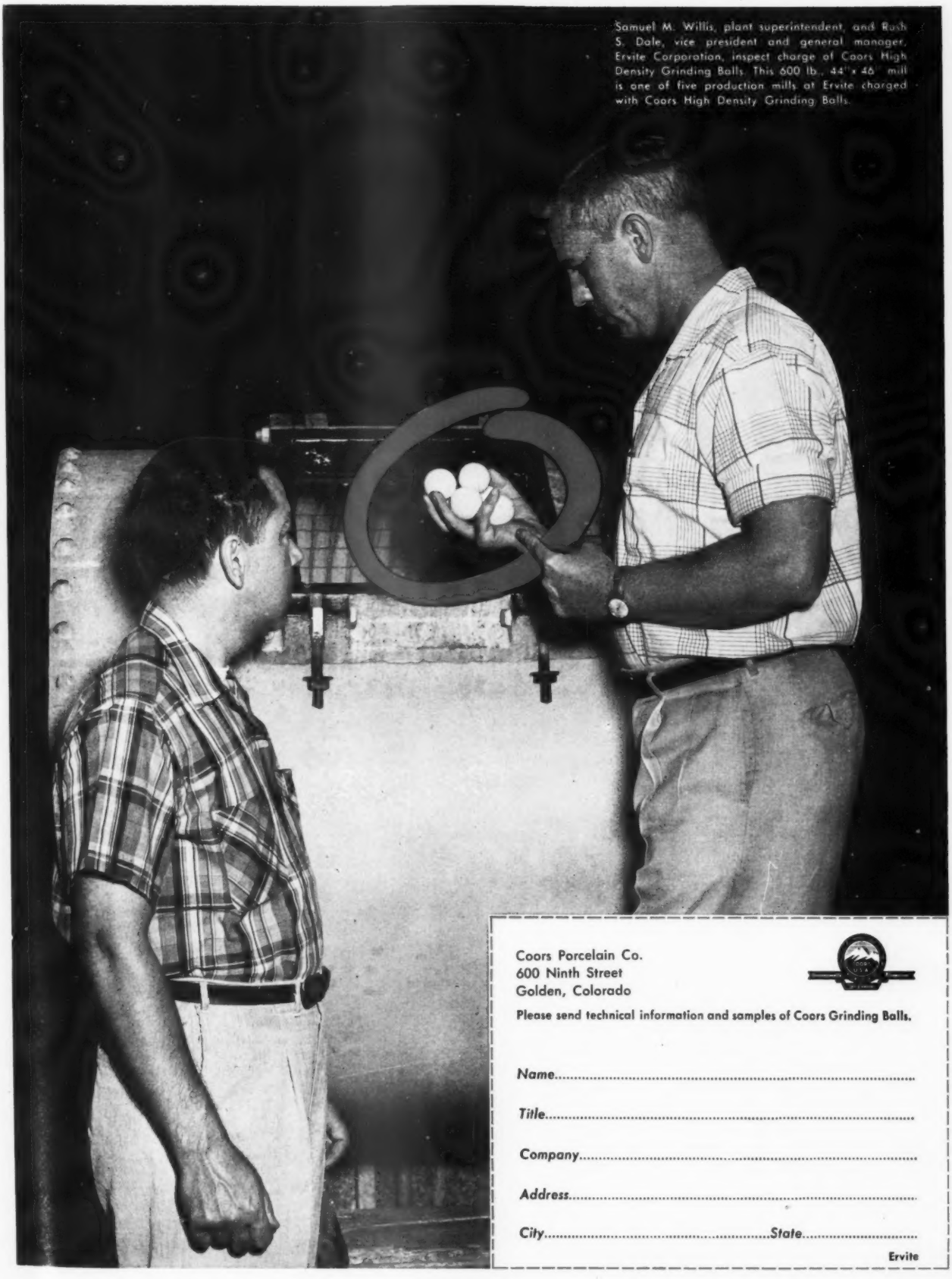
For the first time at any association meeting of this type a panel discussion was held on the new field of explosive forming. The panel was made up of four men who have had experience with this new method. R. A. Cooley, Propellex Chemical Div., Chromalloy Corp., Vasil Philipchuk, National Northern Corp., Jacob Savitt, Armour Research Foundation, and C. P. Williams, E. I. du Pont de Nemours and Co., each reviewed the work that has been done in explosive forming.

At the present time explosive forming is used in missile and aircraft work where the metals and shapes required rule out the use of conventional press methods. It is strictly a hand operation at the present time since no machines have been developed to run explosive forming operations. The sizes of parts formed by this method range from ash tray size to ones as large as five tons.

The most practicable method of directing the forces of the explosion to shape the part is by a liquid. The liquid, usually water, is contained in a cylinder with the explosive charge suspended inside. The metal is placed at the bottom of the cylinder just above the female die. When the charge is set off the force is transmitted to the liquid and then to the metal, forcing it into the die.

All members of the panel agreed that two areas of use exist at the present time: fabrication of large parts, where conventional operations would not be feasible, and, forming of hard metals. Costwise, the field of explosive forming is very narrow. All on the panel agreed, however, that this remarkable method has possibilities of becoming an important method of forming in the future.

PROBLEM-SOLVING SEMINAR includes panel members (left to right): L. L. Lockshin, general manager, Century Engineering Co., Ltd. (Canada); Howard A. Nieberding, superintendent, The American Stamping Co.; Richard C. Berliner, president, C. D. Cash Mfg. Co.; and Harry Krasberg, vice president, R. Krasberg & Sons Mfg. Co. Standing is Stanley R. Cope, seminar coordinator.



Samuel M. Willis, plant superintendent, and Rush S. Dale, vice president and general manager, Ervite Corporation, inspect charge of Coors High Density Grinding Balls. This 600 lb., 44" x 46" mill is one of five production mills at Ervite charged with Coors High Density Grinding Balls.

Coors Porcelain Co.
600 Ninth Street
Golden, Colorado

Please send technical information and samples of Coors Grinding Balls.

Name.....

Title.....

Company.....

Address.....

City.....*State*.....

Ervite

Stainless steels

→ *from Page 39*

diameter electrodes are possible which permits rapid welding of thick plates with one pass. When this method is employed, it is essential that the proper fluxing agent for stainless steel is selected, and that the correct stainless filler rod is employed.

It should be remembered that, in fusion welding, the closer the welded joint approaches the characteristics of the parent metal, the more will the corrosion resistance of the joint compare with the rest of the metal. The alloy content should be the same, or higher, in the weld to produce this effect. If there is any pickup of carbon during welding, corrosion resistance will be impaired. Where complete freedom from intergranular carbides is required, both the plate and the filler material should be of a stabilized analyses. As to distortion, both the ferritic and martensitic steels will behave very much like carbon steel. However, when the austenitic alloys are welded, severe buckling may be experienced which makes it necessary to employ jigging, chill bars, etc. This is due to the fact that the coefficient of expansion and thermal conductivity is roughly one-half and one-third greater, respectively, than that exhibited by carbon steel.

The author wishes to acknowledge the valuable assistance of W. E. McFee, Armco Steel Corp., in connection with the preparation of this two-part editorial feature and the furnishing of suitable illustrations.

Acknowledgement is also given for the aid obtained from Crucible Steel Co. of America and the Republic Steel Corp.

Roll coater

→ *from Page 47*

testing, a rating of B plus on the pencil hardness test is standard for alkyd finishes, while a rating of 2H is standard for vinyls, and 3H to 5H is maintained for epoxies. Color on every coil is visually checked with a standard sample. The coating thickness is measured by a hand micrometer.

Executives at Roll Coater feel that, with this new high-capacity roll coating line, plus a secondary line to be established with the original equipment, the company is in excellent position to meet increasing production requirements for pre-coated metals. It is also felt that the store of experience built up during the past seven years is an invaluable aid in meeting production and quality requirements, and keeping the operation competitive.

WHAT IS HAPPENING IN PORCELAIN ENAMEL . . .

One coat white direct to steel

AN MPM STAFF REPORT

THE RESEARCH DEPARTMENTS of the porcelain enamel frit manufacturers and steel producers have been working for a number of years to develop a practical answer to "one coat white, direct to steel." Much of the early experimental work on the production lines in plants such as Westinghouse, Roper and others was reported in the form of "progress reports" in this publication. Our editors have been in touch regularly with key researchers, and the men on the production lines where practical application tests are run.

As most enamelers know, thousands of square feet of cover coat direct to steel have been run successfully on appliance parts and other fabricated metal products, but to date no plant has turned over its entire production to this method of porcelain enameling.

The work continues in the steel plants, the frit producing plants, and in a number of the country's leading porcelain enameling facilities to arrive at one or more logical methods of applying cover coat porcelain enamel direct to steel. To bring MPM readers up-to-date, we have asked a number of key people in the industry for brief statements on the current status of this development, as they see it in their respective companies. The following represents the first reports received in answer to this request by MPM editors.

Whirlpool Corporation

STATEMENT TO MPM BY:
RICHARD POWELL, GENERAL MANAGER, CLYDE DIVISION

One coat application of porcelain enamel has been a prime goal of industry for many years. One major deterrent to covering iron with a vitreous surface arises from the tendency of the metal to oxidize before it reaches the temperature at which enamel fuses with it. This has made it necessary to apply a ground or bond coat before the porcelain coat is applied. Broad research in recent years has brought us closer to the one coat goal, although it has not yet brought us to it in a practical sense.

At the Clyde (Ohio) Division of Whirlpool Corporation, our research program was inaugurated by exploring the application of porcelain to premium steel developed specifically for the one coat process. Our research shows one coat application of porcelain to premium steel to be satisfactory. However, because of the important factors of price and availability, we elected to broaden our investigations to include the possible use of enameling iron and cold rolled steel in development of the one coat process.

While our tests are not yet conclusive, preliminary results do indicate the practicality of this approach. More research and more field testing is essential before this latter process can be considered to be suitable for production line methods. However, results to date justify the optimistic belief that the first basic change in centuries in the art of enameling is within reach of American industry.

Achievement of this goal will, we anticipate, enable us to provide the same high quality in our porcelain enameled products while holding costs to minimal levels.

Westinghouse Electric Corporation

Westinghouse was one of the earliest companies to do comprehensive research on one coat porcelain enamel direct to steel, to be followed by extensive production on specific parts at the Mansfield, O. plant.

Egon Loeckel, manager quality control department, in a press time report to MPM, states that the company continues to use the method, employing titanium bearing, premium grade steel, on the 40″ range platform. He reports "very good success with the one-coat enamel application." He also said, "We have recently used this steel on the back guard of our range production."

Loeckel reports that experiments have been conducted with a lower priced steel with success on 30″ range platforms. "However," he reports, "on test samples, we find that when attempting to use it on our 40″ platform the warpage is excessive, and it does not lend itself to this application with our present type of range construction. We have also used (it) on our back guard assembly, however, again finding this steel not to be completely satisfactory due to warpage."

The Loeckel report further states, "We are presently doing some development work to attempt to use (a new 'one coat' enameling steel) on some of the range production by incorporating additional superstructure in our product to bring the warpage within commercial limits."

Inland Steel Company

SPECIAL STATEMENT TO MPM . . .

Inland Steel Company has been commercially producing a titanium-bearing one coat enameling steel, TI-NAMEL, for many years. This material, although higher priced than other one coat enameling products, has superior sag and warp resistance and is particularly suitable for large enameled panels.

Inland is currently preparing for production of a single coat enameling iron, ONE-COTE. This sheet will have physical properties similar to regular enameling irons and will carry a lower price than TI-NAMEL. By special, patented treatment of the surface during heat treatment, enameling iron is prepared for one-coat vitreous enameling. The treatment assures good adherence, freedom from fish

scaling and excellent resistance to chipping for the finished product in transit and in service.

Preparation in the enameler's plant for the coating operation for ONE-COTE is the same as for regular enameling iron. The body metal being enameling iron, sag resistance is also as good as for enameling iron.

While the Inland Steel Company has been producing this in experimental lots, regular production facilities will soon be available.

Armco Steel Corporation

Armco states that work continues on their special UNIVIT stock for cover coat application. It is emphasized that this is an experimental product and is being produced in limited quantities on a pilot line for evaluation by porcelain enamel users. The only formal statement released thus far was contained in Armco's 1957 Annual Report which reads as follows:

"Considerable progress has been made in the past year in the field testing of UNIVIT, a steel suitable for one-coat, one-fire vitreous enameling. During 1957, this material was tested by various enameling sheet users to permit them to determine quality and cost factors. UNIVIT has been developed with the expectation that enameling costs can be reduced to a level approaching that of organic finishes. At the same time the resistance of the coating to chipping damage can be increased. As vitreous enamel finishes are preferred by the housewife, an increase in demand is anticipated."

Earlier Reports on One Coat Direct to Steel Exclusive in This Publication

JANUARY, 1944

WILL WE HAVE ONE COAT PORCELAIN ENAMEL?

Reports by G. H. McIntyre, Ferro; F. R. Porter, Inland Steel; R. H. Turk, Pemco; G. Sirovy, Century Vitreous; A. Hayes, Armco; B. T. Sweely, Chicago Vitreous.

JANUARY, 1945

PROGRESS REPORT ON THE PROGRAM OF WHITE ENAMELS APPLIED DIRECTLY TO THE BASE METAL:

APPLICATION OF WHITE ENAMELS DIRECT TO STEEL, by G. H. McIntyre, Ferro.

SPECIAL ALLOY STEEL AIDS DEVELOPMENT, by F. R. Porter, Inland Steel.

APRIL, 1948

PRODUCTION OF RANGE PLATFORMS — COVERCOAT ENAMEL DIRECT TO STEEL, by J. B. Simons, Westinghouse.

DECEMBER, 1948

APPLICATION OF COVER COAT ENAMEL DIRECTLY TO STEEL

A Progress Report by E. H. Shands, Geo. D. Roper.

SEPTEMBER, 1952

EXPERIMENTS WITH WHITE ENAMEL DIRECTLY TO STEEL

By A. L. Friedberg, University of Illinois.

MARCH, 1954

WHAT IS HAPPENING TO ONE COAT PORCELAIN APPLIED DIRECTLY TO THE STEEL?

Reports by G. H. McIntyre, Ferro; R. L. Fellows, Chicago Vitreous; T. F. Olt, Armco Steel; F. R. Porter, Inland Steel; R. H. Turk, Pemco; E. E. Howe, Chicago Vitreous.

Reports from other companies on their work on "one coat direct to steel" will be welcomed by MPM and published as received. Address your communications to Technical Editor.

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● If you are genuinely interested in cutting enameling costs, you must first recognize that there is no such thing as a "foolproof product."

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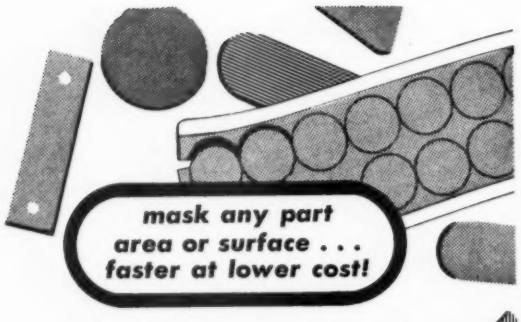

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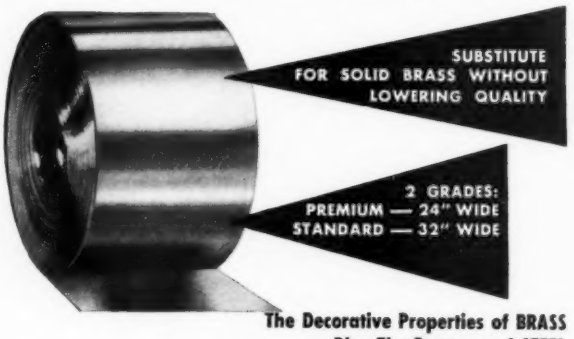

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Production line foreman inspects a coil from the vinyl embossing process. The coated steel is produced in both sheet and coil, and in gages ranging from 18 to 28, and widths up to 52 inches.

Vinyl on steel embossed after application

THE U. S. STEEL CORPORATION has recently introduced a vinyl-coated steel sheet that is made in the mill by a continuous process in a wide variety of embossed patterns and colors. The process consists of coating steel with liquid vinyl plastisol, subjecting it to a heating cycle to harden it and, before it cools, embossing the surface with an engraved steel roll.

The resultant vinyl-coated steel is similar to the laminated type but, as yet, is not produced in as wide a range of surface textures, or in multi-colors on one sheet. According to Richard B. Lord, director, product development division of U. S. Steel's commercial department, almost any shade desired can be produced, including the heavily-metallized opalescent finishes which are becoming increasingly popular. At the present time, the textures are standard, but any texture that can be engraved on an embossing roll can be ordered specially, if the volume of business is large enough.

Seven standard textures are available, including two leather patterns. The leather patterns have been the most popular so far, and have been used in such diverse applications as railroad car interiors by Pullman-Standard Car for the Chicago & Northwestern Railway Co., school cabinets by Calcor Co., and business record storage cabinets by The Wright Line.

Exotic patterns are prevalent in such architectural applications as room partitions and doors for interiors. The exotic patterns were especially designed for U. S. Steel by their industrial design consultants, Peter Muller-Munk Associates.

Produced in range of thicknesses

The vinyl coating is produced in controlled thicknesses of .008 inch to .020 inch as specified by the customer. The steel can be supplied as cold rolled, galvanized, or galvanized painted in 18 to 28 gage, up to 52 inches wide, in coils or cut lengths. Both commercial quality for flat work, or drawing quality, special killed steel for deep forming, are available.

Standard drawing, forming possible

Standard draw dies and fabrication methods can be used with these vinyl-

to Page 93 →

New products

→ *from Page 59*

Chemical Finish For Aluminum

A chemical process for finishing aluminum has been developed. The non-electric process produces a grainy-structured satin finish on different types of aluminum alloys, and is said to be both low in cost as well as highly corrosion

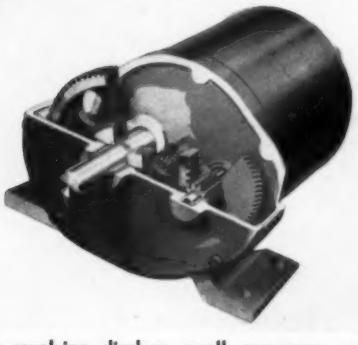
resistant, being unaffected by all solvents, mild alkalies, or acids. It is also reported that surfaces can be refinished after years of outside exposure without removal from the installation.

Some of the advantages claimed of the process are: (1) excellent bond ability without priming, (2) high impact and abrasion resistance, (3) no effect on the finish with slow or rapid temperature changes, (4) and electrically conductive surfaces which can be welded without discoloration.

For further information, contact Dept. MPM, Republic Chemical Co., 13068 Saticoy St., North Hollywood, Calif.

Low-Cost Gearmotor

A low-cost gearmotor using an integrally-mounted, ¼ hp, split-phase motor has been developed. Using precision cut gears, it provides speeds of 30, 60, or 120 rpm, with developed torque of up to 433 inch pounds. The manufacturer recommends this gearmotor for rotating



or revolving displays, small conveyors, and other equipment requiring low speed motive power.

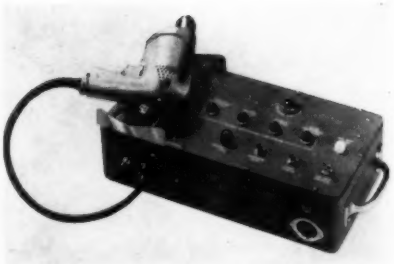
The gearmotor is mounted directly to a cast aluminum gear housing and has a total weight of 18 pounds. Overall measurements are 6" x 8½" x 11". It is designed for 115 volts ac, 50 degrees C rise above ambient.

For further details, write Dept. MPM, von Weise Gear Co., 9353 Watson Industrial Park, St. Louis 19, Mo.

Electric Tool and Appliance Tester

An electrical tool and appliance tester that is capable, it is claimed, of almost automatically programming and testing ac portable electrical tools, appliances, fractional hp motors, extension cords, and other small electrical items, has been developed.

The Model B-100 will test for normal, open



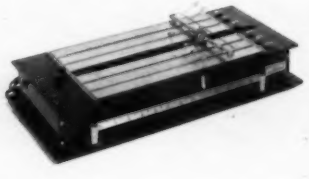
circuits, ground and shorting conditions, and include a Hi-Pot test feature within these circuits. It operates from 110-120 volts ac, 60 cycles.

For further information, contact Dept. MPM, Pow-R-Safe, Inc., 308 Main St., East Orange, N. J.

Recorder Device Measures Chemical Drying Time

Scientifically-precise measurement of drying time of any paint, varnish, lacquer, enamel, or any other chemical product is possible, it is claimed, by use of a recently-developed drying recorder device.

To measure the drying time, films of the materials to be tested are applied with a specially-designed film coating gage to specimen metal strips, which are then placed on the table of the recorder.



On each of the coated strips, a hemispheric needle is brought to bear down by means of a movable carriage to which a time indicator is attached.

After the indicator is brought to zero on the time scale, a 110 V. synchronous motor draws the carriage along the length of the strips, making tracks in the film being evaluated. Through a three-speed gearbox, the total travel of the needles can be set to occur in 8, 16, or 24 hours so that drying time of both quick and slow drying materials can be determined, it is said.

For further information, contact Dept. MPM, Eastern Precision Tool & Gage Co., 451 Lehigh Ave., Union, N. J.

New Literature

→ *from Page 63*

Aluminum Brochure

Design information on architectural applications of aluminum is available in a new brochure. The 12-page booklet contains a detailed listing of the properties of architectural aluminum alloys and their use in both standard and basic mill products as building components and materials. Write Dept. MPM, Olin Aluminum, Metals Div., Olin Mathieson Chemical Corp., 400 Park Avenue, New York 22, N. Y.

New Chemicals Data File for Metal Finishing

A new technical data file on Process Chemicals for Metal Finishing has been announced. It includes complete data on the chromate conversion coatings for non-ferrous metals, clear protective coatings for all metals, plating brighteners, and process chemicals and supplies.

If you are a user of these materials, we will procure a copy for you from the supplier. Send request on your letterhead to Special Projects Editor, MPM, York St. at Park Ave., Elmhurst, Ill.

Press and Projection Welders

A new line of press-type spot and projection welders is covered in an illustrated brochure. It is reported the booklet gives complete description and specifications covering the four available sizes, ranging in capacity from 30 to 500 KVA. For the brochure, write Dept. MPM, Federal Machine & Welder Co., Warren, Ohio.

Catalog on Enameling Iron

A complete catalog listing the advantages and special enameling qualities of this manufacturer's enameling iron is available now. This enameling iron is said to have been created specifically for porcelain enameling, and is said to have excellent resistance to sag. It is said to maintain dimensional stability under high firing temperatures and, in forming, fewer strains are set up in the metal. For more information, write Dept. MPM, Armco Steel Corp., 2778 Curtis St., Middletown, Ohio.

Pocket-Size Data Book on Steel And Aluminum

A new edition of a 256-page, pocket-size data book includes aluminum analyses, characteristics, mechanical properties and tolerances, in addition to previously-published data on steel. The range of information on steel covers machining and fabricating data, manufacturing practices and tolerances, weights, safe loads, ASTM standards, compositions and properties, and other facts of value to purchasing agents, engineers, and shop men. For information on where to get the book, contact Special Projects Editor, MPM, York St. at Park Ave., Elmhurst, Ill.

Plated aluminum die castings for washing machine agitator parts

improved production procedures make possible the use of plated aluminum die castings with a weight saving of six pounds, lowered inertia, and other benefits

by F. M. Metrailer • GENERAL MANAGER, KITCHEN-QUIP, INC.

THANKS LARGELY to some outstanding development work by Kitchen-Quip engineers, in cooperation with plating equipment and materials suppliers, new Philco-Bendix automatic washing machines for home laundries now are equipped with three carefully plated aluminum die castings as parts of the new agitator that gives 600 impulses a minute to wash water.

This development yields several advantages. Most important of these is a saving in weight of six pounds in each agitator. Three of its parts originally were designed as zinc alloy die castings because this type of casting was considered lower in cost and easier to plate.

Inertia forces greatly reduced due to lower weight

Other benefits besides weight saving, however, include much lower stresses on the driving mechanism because inertia forces are greatly reduced by the lower weight. This is especially important where there is constant change in the direction of motion of the driven parts.

Contributions resulting from the new development include: (1) ability to produce aluminum die castings of unusual smoothness, (2) development of contours and of polishing procedures that yield the precise shape required, especially in the topmost casting of the assembly, and (3) ability to produce, consistently and at reasonable cost, a high grade of plating capable of resisting long exposure to the corrosive conditions of normal service, without failure or noticeable deterioration.

Tests indicate minimum ten-year service life

All of these had to be demonstrated to the satisfaction of the customer, but his accelerated tests indicate a useful normal service life of at least ten years. Such developments, though quickly achieved in this case, are an outgrowth of some eleven years of experience in plating aluminum parts with marked success.

Fig. 1 — Three die cast aluminum parts for the washing machine agitator assembly. All are given copper-nickel-chrome plating to increase smoothness, corrosion resistance, and to enhance appearance. (Top to bottom)—Top component, intermediate part, and bottom plate.

Aluminum alloy die castings generally are considered hard to plate successfully and consistently, but the present development has demonstrated that the troubles encountered heretofore can be overcome if their cause can be learned and proper remedies applied. In this case, the remedies consisted chiefly in careful control, holding variables within close limits, close cooperation with producers of plating equipment, and in advanced plating procedures originated by companies that have done much research work along required lines.

Thanks largely to this cooperative effort, Kitchen-Quip not only met customer requirements but did so with high economy. It has been demonstrated that plated aluminum die castings can be produced in successful competition with plated zinc alloy die castings that heretofore had the call, largely because of ease in plating. In many cases, *un*plated aluminum die castings already had proved less expensive than *un*plated zinc die castings. When plating was required, however, the advantage usually was reversed. This situation now has changed in the case cited, as well as in a few other applications, and is expected to be altered similarly in other cases.

In the instance here considered, the castings, Fig. 1, are parts involving hubs and flanges. Two of the flanges have

Fig. 2—Using an abrasive belt to bring out highlights of top agitator.

wave-like convolutions. These convolutions, along with an oscillating motion (equivalent to that of a flange on a shaft bent at an angle) as the flange is rotated, impart impulses to water used for washing. Such impulses are rapid and provide the fast washing action attained.

When heavier die castings were used, the reactions on the driving mechanism of the washing machine were severe. With the much lighter aluminum die castings, however, the reactions are greatly reduced and drive troubles now are reported insignificant. Two synthetic rubber discs separate the three die castings when the five parts are combined into one assembly. This leaves the two lower castings partly covered, and only the top one fully exposed over a large area. All are completely plated, but only limited polishing is needed on the bottom one. Plating on the lower pair is primarily to increase corrosion resistance, but good appearance of the intermediate one also is important.

Polishing for appearance and to minimize friction

It is necessary, however, to polish the top face of the top casting, as in Fig. 2, and parts of the intermediate one, Fig. 3, both for appearance and to resist corrosion as well as to minimize friction with clothes being washed. In the design of the top casting, there are included on the top face (partly for appearance reasons) three radial crest lines spaced 120 degrees apart. These were not very high nor very sharp, but wheel polishing tended to eliminate the lines.

To avoid this, the shape of the casting near the crests was altered slightly, but polishing is now done in such a way that the cutting by the wheels leaves crest lines as specified, solving a minor problem. Specifications require buffing of the whole top face. This is done by a rag wheel to which cutting compound is applied.

In all cases, polishing starts with the application of an abrasive belt to remove parting lines. Other belt work is required elsewhere, but it is minimized because care is exercised to produce castings that are as smooth as possible on all surfaces, as cast. As the parts are cast, Fig. 4, within the plant, smoothness is well controlled. This helps, of course, to minimize polishing costs, and is important because they constitute a major factor in total costs.

Smoothness of castings is aided by using ceramic pots for aluminum alloy melting and holding purposes, so as to avoid iron pickup. Skillful operation of rag wheels and of polishing compound also helps to reduce polishing costs. Naturally, no burrs can remain when polishing is completed, as they would catch in fabrics being washed. All three discs have rounded edges and, when parting lines are polished off, few burrs remain. When wheel polishing is completed, all parts are burr-free and ready for cleaning and plating.

Pre-plating treatment

Several years ago, experience in our plant led to the conclusion that, since it was relatively easy to plate pure aluminum parts but much more difficult to plate aluminum die castings, it must be the alloying elements that caused plating troubles. In the No. 380 alloy used in these parts and quite common in die casting, there is about 8.5 per cent silicon and 3.5 per cent copper. If these could be removed *on the surfaces*, without unfavorable effects upon the aluminum, it was thought that plating would be much simplified.

Experiments showed that this could be accomplished by properly cleaning and etching the parts in concentrated acids. In any event, this procedure has tended to make plating much better and to avoid certain troubles encountered before. Accordingly, this treatment now is used on all aluminum castings plated in the plant.

Before such etching, however, the castings are cleansed by a 20-minute dip in a cleaner solution in a semiautomatic tank with heavy solution agitation. This is followed by a cold rinse and then by the etching treatment. Another cold rinse makes the parts ready for the common sodium-zincate treatment used before aluminum parts are plated. This treatment takes place

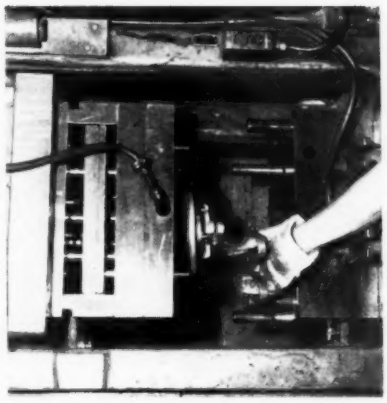


Fig. 4 — Removing a casting from the machine in which it is produced.

at room temperature, requires a dip of two to fifteen seconds, and is followed by three rinsings in cold running water. Castings then are ready for the plating operation that is quite similar to that done on other metals that require copper-nickel-chrome applications. Exacting controls are essential for consistently-favorable results.

Plating procedure

A flash of copper is needed, and it is applied in a static tank containing a closely-controlled standard cyanide solution held at 130° F. Three cold water rinses follow the copper plating

Fig. 3 — Intermediate castings, some of which appear in the foreground, are polished by an abrasive belt on surfaces exposed in service

Fig. 5 — Removing a rack of aluminum die castings from the semi-automatic tank in which nickel plating is done under carefully-controlled conditions.

EXCLUSIVE MPM PHOTOS

and make the castings ready for bright nickel plating.

Nickel plating is done in a semiautomatic tank, Fig. 5, using bagged anodes and close control. Although "standard" bright nickel solutions can be used, present practice is to employ a modified solution, including a brightener.

Nickel solution temperature is held at 130° F., and time is from 27 to 54 minutes, sufficient to apply from 0.0008 inches to 0.001 inches of coating thickness. In this tank, agitation and filtration are continuous. Current density is varied to suit the pieces in process.

Two cold water rinses follow nickel plating. Then, the castings are re-racked and undergo bright crack-free chrome plating, Fig. 6, ranging from 30 seconds to 3 minutes, depending upon customer specifications. This plating is bright and requires no coloring.

Three cold rinses subsequent to chrome plating are followed by a hot rinse, the latter to promote rapid drying. Parts that have tapped holes are given five rinses. Some 5,000 parts a day are plated in the manner described.

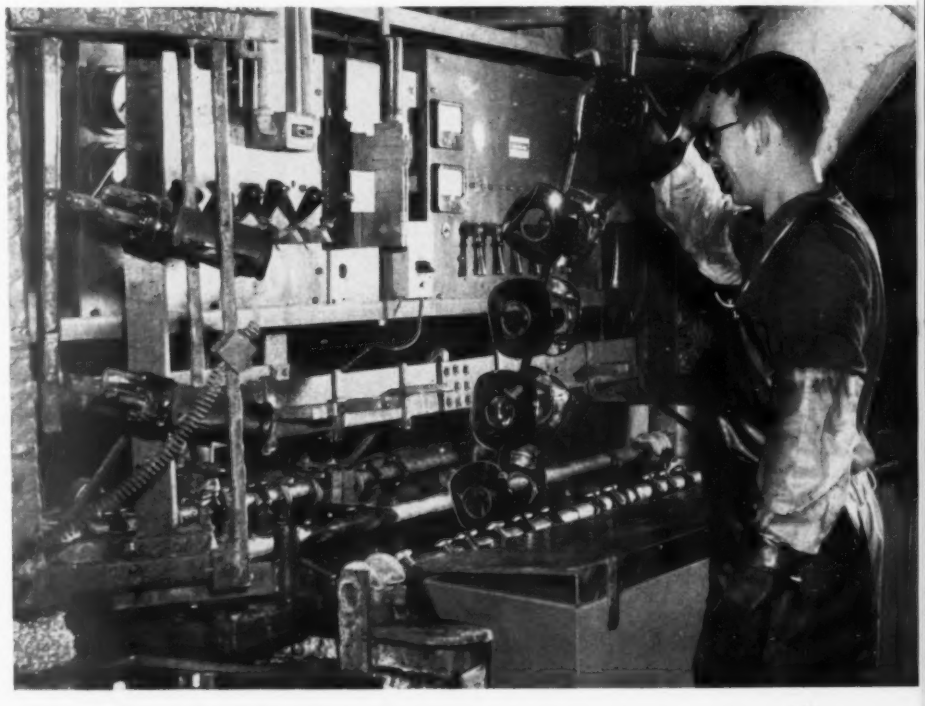
Varied processing for appliance parts

Other aluminum die castings, used by other makers of appliances, are plated in the same way as are the agitator castings, as they have been for several years. In some cases, however, the bright surface is not produced by wheel polishing. Some is done at lower cost by ball burnishing in a barrel, lined with synthetic rubber, in which the parts are racked to prevent them from impinging against each other as the barrel turns. This burnishing does not provide as bright a surface as wheel polishing, but costs less and is satisfactory for many parts. The burnish extends into recesses that are not reached in wheel polishing.

Before aluminum die castings are ball burnished, they are subjected to the acid etching already mentioned, to remove alloying elements from surfaces. This helps to yield a brighter burnish and one that does not fingerprint easily. In fact, the burnish often is used without plating, as it is sufficient for long shelf life, and meets service requirements for many products in which the extra cost of plating is not justified. This type of burnishing adds to sales appeal, and is employed on some kitchen appliances and on some electric hand tools to good advantage.

Plating materially yields a high luster and, as chromium does not tarnish significantly, the luster is enduring. Some die cast aluminum camera components, among other parts, have been produced with a dull or satin finish in our plant, by slight changes in plating procedure, especially where high reflectivity is not wanted. They have a distinctive appearance that is enduring, and parts of this type are expected to find an increasing market.

Fig. 6 — Lifting a rack of top agitator parts from the tank in which they have been chromium plated. Parts have a high luster, and do not require coloring.



New A. O. Smith — Erie Division

Erie Meter Systems, Inc., which was purchased last November by the A. O. Smith Corp., Milwaukee, Wis., formally has become a part of the latter company instead of operating as a wholly-owned subsidiary.

H. G. Smith, president of Erie Meter, said that the company is now a part of the new Smith-Erie division, which also includes the A. O. Smith Meters and Service Station Pump divisions in Los Angeles. The change will have no effect upon employment, personnel, or production in Erie, he said.

L. F. Smith, formerly executive vice president of Erie Meter Systems, will continue in charge of the Smith-Erie division operations in Erie, H. G. Smith stated.

Columbus Vice President Studies European Techniques

William D. Hedges, vice president for product research and development of the Columbus Coated Fabrics Corp., Columbus, Ohio, departed recently from New York for a six-week business trip to Europe. He will investigate possible new raw materials and production techniques in England, France, Germany, Switzerland, Italy, and Belgium.

New Ferro Affiliate in Spain

Ferro Corporation, Cleveland, Ohio has just concluded negotiations for the establishment of a new overseas affiliate in Bilbao, Spain, it has been announced by Robert A. Weaver, chairman. To be known as Ferro Enamel Espanola, the new company will be jointly owned by Ferro and the Spanish firm of Union Quimica Del Norte De Espana, Spain's leading producer of organic and inorganic chemicals, and will be capitalized for approximately half a million dollars. It will engage in the production of porcelain enamel and glaze frits and inorganic colors for sales throughout Spain. This brings to 13 the number of Ferro foreign subsidiaries and affiliates.

Chicago Job Enameling Plant

It has just been learned that a new continuous-furnace porcelain enamel "jobbing" plant has begun operations in Chicago. The firm, Doral Enamel Products, Inc., is located at 1137 W. 14th St. Although the company is new, its two top executives have been associated with the porcelain enameling industry for a combined total of 44 years. O. Curtis Jacobsen, president, and William E. Martin, executive vice president, have headed their own engineering and sales firm in the architectural porcelain enamel business, Porcelain Engineering Co., since 1945. Both got their start in the porcelain enamel field in 1937 as employees of Chicago Vitreous Corp.

The selection of centrally-located Chicago for this new operation was made to provide companies within reasonable trucking distance of Chicago with a logical source for production items with porcelain enameled finishes, the announcement states.

Moffats Limited to Manufacture Norge Products

Moffats Limited started manufacturing and marketing Norge appliances in Canada, effective March 1st, under an agreement announced recently.

H. C. Darroch, Moffats' president and general manager, said Norge refrigerators and laundry equipment will be produced at Weston, Ontario, under a license agreement with the Norge division, Borg-Warner Corp., Chicago.

Existing Moffat lines include electric and gas ranges, built-in ovens and surface cooking units, dishwashers, Moffat-Bendix Duomatic washer-dryers, Moffat-Bendix dryers, room air conditioners, water heaters, commercial cooking equipment, heating equipment, architectural panels, and other products. The new lines to be manufactured by Moffats include refrigerators, freezers, automatic and wringer washers, clothes dryers, and combination washer-dryers. The company was established in 1882.

Armco Announces Stainless Expansion Program

A $775,000 expansion program to increase Armco Steel Corporation's stainless steel output has been started at the Baltimore, Md., works. Two new double ingot heating furnaces and three new heat-treating furnaces are to be installed. The new furnaces will be in operation in about six months.

Cribben and Sexton Elects Board and Officers

Bertram Given, president of Waste King Corp., Los Angeles, has been elected chairman of Cribben & Sexton. Howard Given, executive vice president of Waste King, was elected a director and vice chairman of the company. Wendell C. Davis, president of Cribben was reelected a director. New officers elected by the directors include Robert E. Johnson, vice president in charge of engineering; Henry Lutkus, vice president in charge of industrial relations; and Howard Given, secretary and treasurer.

Buck Elected Director of IHEA

Robert M. Buck has been elected director of the Industrial Heating Equipment Association at its annual winter meeting in Cleveland, Ohio. The term is for three years. President and general manager of The Bryant Industrial Products Corp., Cleveland, Buck was also elected chairman of the Combustion Equipment division of the association.

Educated at the University of Michigan, he joined the Michigan Consolidated Gas Co., Detroit, and was later appointed director of their industrial laboratory. In 1944, Buck moved to Cleveland where he became associated with the Industrial division of the Bryant Heater Co. as chief engineer.

New Moore's Gas Heater Line Introduced by Locke Stove Co.

A new "1500-Series" of Moore's gas heaters, completely restyled and offering a number of new features for added convenience and improved operation, have been introduced by Locke Stove Co., Kansas City, Mo. Heater illustrated is model 1550 with 50,000 Btu input.

New Wyandotte Plant

Robert B. Semple, president of Wyandotte Chemicals Corp., has announced completion of negotiations for the purchase of the Atlanta plant of Tesco Chemicals, Inc. Wyandotte assumed operation of the Tesco plant March 1. Wyandotte will manufacture a complete line of its J. B. Ford Div. products at the newly acquired plant, according to Ford Ballantyne, Jr., a vice president and general manager of the Ford Div.

Norge Adds 700 Workers

The Norge (home appliance) Division of Borg-Warner Corporation has added 700 workers and a second shift at its Muskegon Heights, Mich., refrigerator and home freezer plant.

Judson S. Sayre, Norge president, said that orders taken during meetings with distributors in Chicago made the expansion necessary.

"Factory sales of refrigerators and home freezers are running three to four times higher than those for this period in 1958, and we're back-ordered for weeks though facilities are taxed to capacity," Sayre noted.

Refrigeration equipment business is sparking the entire line, he added.

Sayre said that the upturn started in January, when full-line appliance sales volume rose nearly 10 per cent ahead of the like 1958 month. In February sales jumped another 15 per cent ahead of last year.

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Appliance Technical Conference to be Broad in Scope

The 10th Annual Appliance Technical Conference, sponsored by the Sub-Committee on Domestic Appliances of the AIEE Domestic and Commercial Applications Committee, will be held at the Hotel Manger, Cleveland, Ohio, May 18-19, 1959.

An indication of increasing recognition of the importance of this annual conference can be measured by the fact that the attendance for the 1958 conference in Chicago showed an increase of over 30 per cent over the 1957 conference in Detroit.

The program committee canvassed a broad group of engineers throughout the appliance industry before planning the program that will be beneficial to the engineering profession in all major segments of the appliance industry, including cooking and heating, home laundry, air conditioning, small appliances, and other specialized products. The point has been stressed by the committee membership that *all* appliance engineers (United States, Canada, and other countries) are invited to attend, irrespective of whether they are members of AIEE. The purpose of the conference is to develop industry-wide benefit.

Two groups that have been very active in sponsoring the 1959 Appliance Technical Conference are the Cleveland section of AIEE and the Single Phase and Fractional Horsepower Motors Subcommittee of AIEE.

Representing the Cleveland section as local chairman of the conference is E. G. Merrick, General Electric Co., and the Fractional Horsepower group is represented by L. C. Schaefer, Century Motors, Inc., St. Louis.

Appliance engineers or management men requiring additional information on the 1959 conference should contact Marvin A. Fuller, Chairman AIEE Subcommittee on Domestic Appliances, c/o Whirlpool Corp., St. Joseph, Mich.

PROGRAM

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS

10th Annual Appliance Technical Conference

May 18-19, 1959, Hotel Manger, Cleveland, Ohio

Sponsored by: Cleveland Section, AIEE; AIEE Subcommittee on Domestic Appliances; with cooperation of AIEE Subcommittee on Single Phase and Fractional Horsepower Motors.

MONDAY, MAY 18 — *Morning Session, 9:30 A.M.*

Presiding: M. A. Fuller, Chairman, AIEE Domestic Appliance Subcommittee, Whirlpool Corp.
Welcome Address: Henry Martin, Chairman, Cleveland Section, AIEE, Martin-Retteger, Inc.
Keynote Address: O. H. Yoxsimer, Westinghouse Corp., Springfield, Mass.
An outstanding technical personality of the appliance industry speaks his mind.

"A Theory on Dynamic Surface Tension in Home Laundry Solutions"
Dr. Gale Cutler, Whirlpool Corp.
Classical studies of the surface tensions of solutions have been done under static conditions. In home laundry appliances, new surfaces are continually formed with a life span in microseconds.

"Polycrystalline Ceramics with Unique Physical, Thermal, and Electrical Characteristics"
George W. McClellan, Corning Glass Works
A discussion and some demonstrations of materials which can be designed with a wide range of physical properties that are better suited to some appliance applications than either glass or conventional ceramics.

MONDAY, MAY 18 — *Afternoon Session, 1:15 P.M.*

Presiding: B. F. Parr, Vice Chairman, AIEE Commercial and Domestic Applications Committee, Westinghouse Electric Corp.

"Current Studies of the Peltier Effect"
J. S. Shilliday, Battelle Memorial Institute
A resumé of the current state of the art.

"Applying Computer Techniques to Appliances"
Richard Prucha, General Electric Co.
A discussion of techniques used on temperature distribution in refrigerator walls.

A tour of Nela Park of the General Electric Co.

"Applying Lighting Techniques to Appliances"
W. R. Stevens, General Electric Co.

TUESDAY, MAY 19 — *Morning Session, 9:00 A.M.*

Presiding: William Vermuelen, General Electric Co.

"Electric Controls for the Parameters of Combustion"
James Wright, White-Rodgers Co.
A system examination of air, fuel, and ignition with emphasis on the circuits and functions of controls.

"An Automatic Meat Probe Control"
C. J. Holtkamp, Westinghouse Electric Corp.
A discussion of parameters to control degree of roasting of meat and maintenance of this condition in the oven beyond normal cooking time.

"An Automatic Oven Range Timer"
W. R. Buechler, General Electric Co.
A discussion of a design program involving definition of problems, determination of a basic concept of solution, and a rigorous analysis of the motions involved and the process capability in maintaining dimensional tolerances.

"Why Protected Motors Can Burn Out"
A. P. White, Spencer Thermostat Div., Metals and Controls Corp.
A discussion of the characteristics of overhanging situations in electric motors and the design of protective controls.

TUESDAY, MAY 19 — *Afternoon Session, 1:30 P.M.*

Presiding: Vic Petchul, Watson Publications

"Motor Insulation Performance in the Home Laundry Equipment Environment"
Les Dogger, Whirlpool Corp., and Don Mahrman, General Electric Co.
A report on evaluation of certain motor winding insulations and their ability to resist deterioration by home laundry cleaning solutions.

"A Motor Design for a Specialized Application"
A. G. Ostrognai, General Electric Co.
Standardizing motor components for vacuum polisher, etc.

"An Engineering Appraisal of Standards Program"
T. H. Cline, Newark Stove Co., and W. R. Milby, Detroit-Edison
A special analysis of the papers, reports, and discussions regarding standards programs from past conferences and what they mean to the appliance engineer.

In addition, there will be an opportunity to sign up for tours of the AGA Testing Laboratories in Cleveland.

H. W. Tuttle Moves to Tecumseh

H. W. Tuttle & Co., manufacturers of Nykelkrom and Adaptatherm heating elements, announce the movement of the company from Adrian, Mich. to Tecumseh, Mich. At this new location, production facilities will be housed in a modern one-story building which was purchased recently, while general offices and an expanded engineering department will be housed in a new two-story structure erected at the front of the existing building.

The interior of the new plant is completely color styled, using safety techniques to provide greater efficiency and better working conditions. In making the announcement, the company issued a general invitation to "visit us in our new home."

"In Adrian," said Mrs. Madeline K. Tuttle, president of the company, "Our production facilities were split between two plants. Our new plant will bring everything under one roof and increase our manufacturing area by more than one-third. In addition, having all manufacturing on one floor will allow us to set up more efficient, modular, 'U' flow-type production lines. Our general offices will be much larger and more convenient, and we are doubling the space for our testing laboratory and engineering department."

Kaiser A & C Moves Sales Offices to Oakland

Officials of Kaiser Aluminum & Chemical Corp. announced recently that they will move the firm's general sales offices from Chicago to Kaiser Center, Oakland, Calif. in planned stages prior to September 1. The company will retain in Chicago its present regional and district sales headquarters, an executive office, and some personnel whose activity is primarily concerned with technical and field service.

"Bringing together all of Kaiser Aluminum's policy making groups in management, production, sales and market development in one headquarters will make possible more coordinated and effective action in the selling era that lies ahead in the aluminum industry," John Menz, the company's vice president for marketing, declared in making the announcement.

Menz pointed out that, in anticipation of the forthcoming move, the company had earlier established six regional sales managers in close proximity to major market centers with broad authority to make decisions involving customer service. These regional managers direct the efforts of 18 district and 35 branch sales offices located in important industrial cities.

Porcelain Enameled Houses

Renewed confidence in the practicality of an all-porcelain enamel house was expressed recently by Ferro Corp., Cleveland, with the announcement of the retention of the architectural firm of Carl Koch & Associates to design three such houses within the next six months. According to Glenn A. Hutt, vice president and director of Commercial Development for Ferro, who made the announcement, "Our retaining of Carl Koch & Associates is the first phase of a many-stage progression towards what we hope will be the ultimate mass-production of an all-porcelain enamel house as well as porcelain enameled modular residential building components."

Karl Koch, senior partner in the firm which bears his name, is the designer of the Acorn — Lustron and Techbuilt prefabricated homes. A leading proponent of mechanization in the home building field, he has often expressed the view that this area could benefit greatly from a highly industrialized building process which would substantially reduce the waste and inefficiency of present building methods.

Industrial Furnaces Up

Industrial Heating Equipment Association reports net new orders for industrial furnaces in January 1959 totaled $3,518,000 compared to the 1958 monthly average of $3,694,000. However, January 1959 new business was up 19 per cent from the January 1958 volume of $3,045,000.

Company Moves

Metalcraft Products Co., Inc., has moved from Mascher & Lippincott Streets to 6225 State Road, Philadelphia 35, Pa.

Maytag Sales and Earnings Second Highest in History

The Maytag company's 1958 sales and earnings results, second highest in company history, were "accomplished without the benefit of a general price increase and in a year marked by the sharpest industrial recession since the war," according to Fred Maytag II, president. Consolidated net sales of the Maytag company and domestic subsidiaries during 1958 were $105,763,763,- an increase of 7.3 per cent over 1957 sales of $98,613,291. The current figure is second only to the record sales year of 1956. Net income during 1958 totaled $9,895,202, a 49.2 per cent increase over earnings of $6,633,292 the preceding year, and second only to the high year of 1950. Looking ahead, Maytag said, "Present forecasts for 1959 predict a growing consumer demand, supported by high purchasing power, for home laundry equipment. If these predictions prove accurate, we anticipate another good year.'

NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS

21st ANNUAL CONVENTION PROGRAM

Monteleone Hotel
New Orleans, La.

Sunday, April 12	
Afternoon	Board of Directors Meeting — National Registration
Evening	Early Bird Party
Monday, April 13	
Morning	National Association Meeting — Registration
Noon	NAAMM Luncheon
Afternoon	Tablet and Letter Division Meeting Tour — "Historic Chalmette River and Vieux Carre"
Tuesday, April 14	
Morning	Iron and Steel Division Meeting
Noon	Members' Luncheon Ladies' Luncheon
Afternoon	Tour — "Circle Tour of Garden District"
Wednesday, April 15	
Morning	Buffet Breakfast for NAAMM members and their families Non-Ferrous Division Meeting
Afternoon	Metal Curtain Wall Division Meeting
Evening	Cruise — Steamer SS PRESIDENT
Thursday, April 16	
Morning	Store Front and Entrance Division Meeting
Afternoon	Tour of Kaiser Aluminum Chalmette Works
Evening	Social Hour
Friday, April 17	
Morning	National Association Meeting
Afternoon	Board of Directors Meeting — National Tour — "Modern New Orleans Parks"
Evening	Social Hour

$5 Million Expansion Program Completed by A. O. Smith

A 5-million dollar-plus expansion and modernization program of production facilities, designed to keep pace with increasing sales, has recently been completed by the Permaglas Div., A. O.

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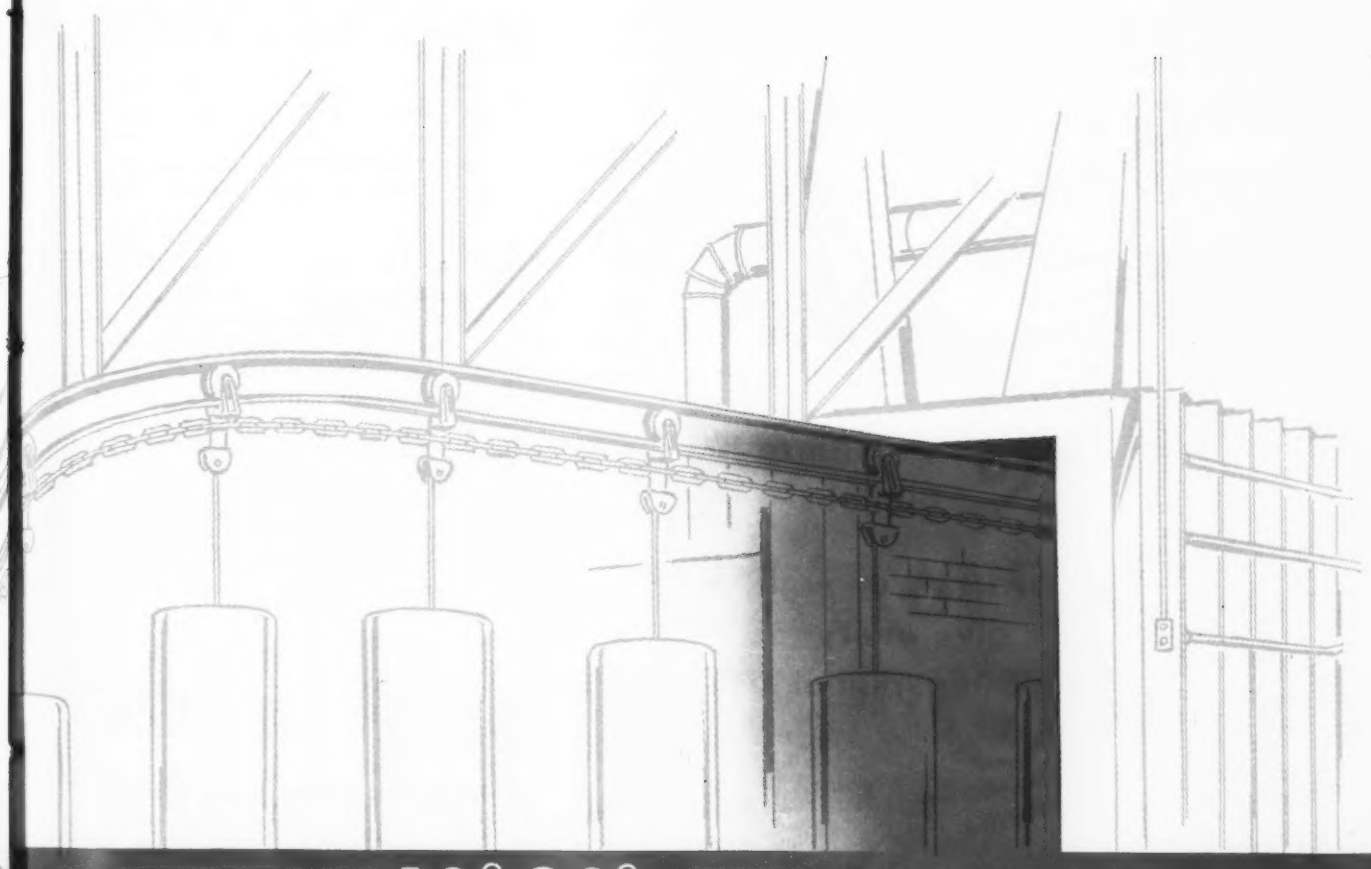
If you want the best hot water tank

ENAMEL



...one that fires 40°-80°F lower than your present enamel

. . . one that gives greatly improved corrosion resistance

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GET ALL THE FACTS NOW FROM YOUR CHICAGO VITREOUS REPRESENTATIVE

or write

Chicago Vitreous CORPORATION

A Division of the Eagle-Picher Company
1425 South 55th Court Cicero 50, Illinois

Serving the Needs of the Industry since 1918

Industry News

→ *from Page 83*

Smith Corp., Kankakee, Ill., according to J. H. Brinker, Jr., vice-president.

The division, a producer of commercial and domestic glass-lined water heaters, also manufactures water storage tanks, residential heating and cooling equipment, water softeners, and glass-lined storage structures for farm and industry.

Included in the expansion program are a $550,000 office addition, $115,000 warehouse, $105,000 research and test facility, modernizations and additions to existing plants, all in Kankakee, and acquisitions of a water softener plant in Omaha. At the same time, facilities have been expanded for the engineering department, and plant offices enlarged.

Three Companies Join NEMA

Three companies have become members of NEMA. They are: Electrolux Corp., 51 Forest Ave., Old Greenwich, Conn.; Monitor Controller Div., Industrial Electronics Co., Inc., 99 Grove St., Rockland, Mass.; and Philadelphia Insulated Wire Co., 220 N. Third St., Philadelphia 6, Pa.

Kelvinator Holds Training School

A week-long training program for zone service managers and field service supervisors throughout the country was held in Detroit, March 9-13 by Kelvinator Div., American Motors Corp.

The program, according to Robert S. Geran, general service manager for Kelvinator, included refresher courses on all current household and commercial appliances and was conducted by specialists from the factory service department.

ASTM Committee C-22

Committee C-22 on porcelain enamel, ASTM, met in Pittsburgh, Pa., recently. The next meeting of the group will be held at Battelle Memorial Institute, Columbus, Ohio, September 29 and 30.

Subcommittee I on research, under Chairman B. J. Sweo, Ferro Corp., is considering the identification of the test needs of the industry. Of immediate concern are tests to evaluate enamels and ceramic coatings for metals for use at elevated temperatures, a more positive and effective test for measuring the adherence of enamels to metals, a technique for determining the bubble structure and continuity of enamel coatings and tests to establish the tendency of porcelain enamel to chip.

Subcommittee II on nomenclature,

under Chairman E. E. Howe, Chicago Vitreous Corp., continued its efforts to prepare an up-to-date glossary of terms common to the porcelain enamel industry.

Subcommittee III on education, under Chairman L. S. O'Bannon, Battelle Memorial Institute, continued its program to publicize the activities of the group, and to encourage industrial use of the standards adopted by Committee C-22.

Subcommittee IV on materials, under Chairman Hollis Saunders, O. Hommel Co., continued considerations of tests on acid resistance, fusion flow, reboil, coefficient of expansion, consistency of enamel slips, torsion, and determination of stress in enamel coatings. Consideration also was given to the problem of pickle wastes and to the problem of a specification for enameling iron.

Subcommittee V on finished products, under Chairman J. C. Richmond, National Bureau of Standards, considered tests for adherence, thickness, alkali resistance, scratch resistance, continuity of coatings, hot-water resistance, mineral-acid resistance, weather resistance, spalling of enamels on aluminum, gloss, impact, and warpage.

Westinghouse Repeats '58 Sales Theme

"Opportunity Days Are Here Again," a repeat of the successful '58 sales theme, wil go into effect on a Westinghouse major appliance promotion that starts this month.

John J. Anderson, manager of the major appliance division, relates that, "Our aim this year is to get the retail salesman to make not only a price comparison, but to sell *up* to the deluxe 1959 models, with their new convenience and features."

Robertshaw-Fulton Net Income Up

Net income of Robertshaw-Fulton Controls Co. amounted to $4,008,819 for the year ended Dec. 31, 1958, compared with $3,920,081 for 1957, T. T. Arden, president, announced. Fourth quarter sales were 19.5 per cent above the 1957 fourth quarter.

Harper Co. Continues Expansion

The H. M. Harper Co., Morton Grove, Ill., manufacturers of non-ferrous and stainless steel fastenings, has announced its program for 1959 capital expenditures. During the year, it is anticipated the company will expend three-quarters of a million dollars for new facilities, equipment and buildings.

NEMA Rural Load Contest

REA cooperatives in Pennsylvania and Arkansas have been declared winners of first and second awards in the Third Annual Rural Home Power Use Contest, sponsored by the Competitive Fuels Committee of the National Electrical Manufacturers Association, it is announced by Ralph Z. Sorenson, contest chairman. Mr. Sorenson is supervisor, utility sales, Westinghouse Electric Corp. NEMA's nation-wide Rural Home Power Use Contest is held for two purposes — to reward power suppliers which have out-promoted and out-sold bottled gas appliances in their respective areas, and to encourage rural people to live and to farm electrically. The 1958 contest, which was open only to REA cooperatives, drew the largest number of entries received so far in the present series of annual competitions.

Design Engineering Conference

Sessions on the choice of materials in design, mechanical aspects of design, and power and control in design will be featured at the fourth annual Design Engineering Conference, sponsored by the machine design division of the

American Society of Mechanical Engineers. The conference is held concurrently with the Design Engineering Show. Both events will take place at Convention Hall, Philadelphia, May 25-28, inclusive, with conference sessions in the morning and the show in the afternoon.

The show is devoted to research and development for industry. Exhibits include products which aid in the designing of new end products. Among the exhibits will be mechanical components of various kinds, power transmission equipment, electrical and electronic components, metals and non-metallic materials, fasteners and adhesives, finishes and coatings, shapes and forms, hydraulic and pneumatic components, and engineering equipment and services.

New Steel Container Plant

Inland Steel Container Co., division of Inland Steel Co., is installing a completely new facility in its Jersey City, N. J. plant, for the production of its full line of steel shipping containers. The "unveiling" will take place June 15.

Pemco Expands Color Plant

Pemco Corp. is erecting a new building which will double the area allotted to the manufacture of color. The steel and concrete building will be 250 feet long and 100 feet wide.

Housed in this building will be equipment for the weighing, mixing, and calcining of inorganic pigments, and the production of various media for ceramic colors.

Baumgart Raps Retail Appliance Advertising

"Home laundry appliance advertising should sell consumers on how to get clean clothes through the benefits of using laundry equipment, not on the basis of price alone," according to Guenther Baumgart, president of the American Home Laundry Manufacturers' Association. Baumgart made this comment on the state of the appliance industry's advertising while speaking recently to the Chicago Chapter of the Electrical Women's Round Table.

Major appliance manufacturers are doing a beautiful job of selling benefits to consumers through national magazine and television advertising, he reported, while some retail advertising generally ignores this appeal. He suggested it would be better if retailers would carry the national advertising theme in their local advertising, telling

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Industry News

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a more complete product and benefit story. "All this emphasis on benefits, features, styling and all the other plusses is forgotten in the enthusiasm to sell on price alone," he said. "This enthusiasm could better be directed into a more positive approach to coincide with the national advertising theme of selling benefits, features, washability, etc."

In commenting on appliance service, he suggested that the appliance industry face up to service as a reality. He pointed out that home service directors have the best opportunity of all through promotions and instruction books to teach consumers what to look for prior to calling a serviceman, how to get good service when necessary, and what to expect to pay for what they get.

Gas Furnaces Set January Mark

Manufacturers' shipments of gas-fired furnaces for residential heating in January were the highest ever recorded for that month, according to the Gas Appliance Manufacturers Assn.

Total gas furnaces of the forced warm air and gravity types was 63,300, up 32.7% from the Jan. '58 figure of 47,700. For boilers, the figure was 5,700, up 1.8% from the 5,600 in '58. For the three central heating types combined, the month's total of 75,800 is up 24.9% from 60,700 one year earlier.

Industrial Finishing Exposition

The 5th Industrial Finishing Exposition sponsored by The American Electroplater's Society in conjunction with its golden jubilee convention will be held at the Detroit Artillery Armory, Oak Park, Michigan, a Detroit suburb. The dates are June 15-19, 1959.

New Statistical Booklet

A new publication entitled "ARI Statistical Program" which describes ARI statistics, the different types of reports and summaries used, and the benefits of statistics generally, has been prepared. Write ARI, Washington, D. C. for a copy.

Mueller Plans Expansion

F. L. Riggin, president, Mueller Brass Co., has reported that consideration is being given to the construction of a new $6-million mill for the production of copper water tube and tubing for the refrigeration and air conditioning industries.

INDUSTRY PERSONALS

Fairmont Aluminum Co., a subsidiary of Cerro de Pasco Corp., has named **Max E. Moran,** formerly New York district manager of the company, to the post of assistant sales manager, with headquarters at Fairmont, W. Va.

Announcement of Moran's appointment was made by W. Bradley Blair, Fairmont vice president in charge of sales, who also reported the designation of **George F. Donahue** to succeed Moran as New York district manager.

Frigidaire Div., General Motors Corp., has promoted **Edmund F. Schweller** to executive assistant chief engineer, according to Richard E. Gould, chief engineer. Schweller, who had been assistant chief engineer in charge of refrigerated appliances, will assume new responsibilities for Frigidaire's overall product engineering activity.

Two other engineering staff appointments were announced concurrently. **Clifford H. Wurtz,** major product line supervisor in charge of refrigeration systems, has been promoted to manager of refrigerated appliance engineering, a part of the activity formerly headed by Schweller.

The managership of a newly-created compressor engineering department goes to **John M. Murphy,** formerly major product line supervisor in charge of refrigerator and food freezer compressor development.

Superior Steel Div., Copperweld Steel Co., has announced two new executive appointments. **Luther F. Taylor** has been promoted to manager of sales development, and **Samuel H. Cole** has been appointed manager of stainless steel sales. Taylor was formerly assistant general manager of sales, and Cole has been an assistant in the sales department for three years.

In his new post, Taylor will be responsible for development of new market areas, sales aids, and new applications for Superior Steel products.

TAYLOR

COLE

Detroit Controls Div., American Standard, has announced three promotions in the marketing department. **Frank Y. Carter** was named manager, marketing planning, **Jack M. Strauss** was appointed product planning manager, air conditioning and refrigeration controls, and **A. C. Stein** was made product planning manager, heating controls.

Rieke Metal Products Corp., Auburn, Ind., announces the appointment of **Raymond F. Ouer** as general manager in charge of sales. He was formerly the assistant sales manager at the Oakland, Calif. office. This office has been moved to Auburn.

Ouer succeeds **Truman W. Floyd,** a company vice president, who has been appointed to the executive committee.

CARTER

STRAUSS

OUER

STEIN

Jas. P. Marsh Corp., Skokie, Ill., has announced the appointment of **A. D. Rose** as president. Rose had been executive vice-president.

Mills Products, Inc., Walled Lake, Mich., manufacturers of PERMA-VIEW oven door windows, has announced that **William E. Bowman** has joined the organization in a sales capacity.

Bowman is well known among appliance manufacturers, as the result of a seven-year connection with Robertshaw Thermostat Division of Robertshaw-Fulton Controls Co., where his most recent position was that of sales manager of the company's Indiana division. Prior to his connection with Robertshaw, he was with Allegheny Ludlum Steel Corp.

ROSE

BOWMAN

Behr-Manning Co., Troy, N.Y., manufacturer of coated abrasives and pressure-sensitive tapes, has named **Thomas Trowbridge** as general sales manager of its Coated Abrasives division. At the same time, **Thomas G. Gilcoyne** was appointed field sales manager of the division. The appointments were announced by Henry R. Merrill, vice-president of marketing.

General Extrusions, Inc., Youngstown, Ohio, has named **Anthony A. DeLuca** as Pittsburgh area sales representative. A University of Pittsburgh graduate, DeLuca has been identified with aluminum sales for the past eight years.

Allied Steel & Conveyor Div., Sparton Corp., has announced the promotion of **W. Bradley Gilkey** to central region sales manager for Sparton Tri-Belt device car. Formerly an assistant to Warren E. McKittrick, vice-president and general manager of Allied Steel & Conveyor, Gilkey will maintain his headquarters at the Detroit factory and travel from that point.

Waste King Corporation's Technical Products Div. has revealed that **Bert R. Golgart** has been appointed technical representative. The appointment was announced by Boyd T. Marshall, vice president—engineering program development. Prior to joining Waste King, Golgart served for five years as sales manager of Vard, Inc., Pasadena aircraft and missile component manufacturer.

Whirlpool Corporation's board chairman, Elisha Gray II, has announced that **Juel M. Ranum** has been named to a new position as assistant to the chairman of the board. Ranum will retain his former responsibility as director of public relations and vacate the position of assistant to the president. In his new position, he will expand the overall company public relations efforts and be concerned primarily with corporate matters affecting the external relations of

the company. He is also director of the American Home Laundry Manufacturer's Assn.

John Livingston becomes assistant to the president, moving from his former position of general manager, laundry and vacuum cleaner products, sales, to Sears Div.

Eastern Chemical Div., Hooker Chemical Corp., has announced four new appointments, according to F. W. Willers, vice-president and general manager of the division. **John S. Coey** is now sales manager, **Robert F. Schultz,** production manager, **A. Richard Perry,** comptroller, and **Philip D. Bosso,** industrial relations manager.

The latter three positions are newly-created, and responsibilities of all appointments extend to Eastern Chemical's three plants.

Norge Div., Borg-Warner Corp., has appointed **Dan G. Fanelli** as built-in range sales manager. According to James Ruff, Norge director of sales planning, Fanelli will be responsible for national sales of Norge gas and electric wall ovens and cooking tops. He was formerly sales manager in charge of built-in ranges for Admiral Corp., Chicago.

Metal Glass Products Co., Elkhart, Ind., a subsidiary of Barler Metal Products, Inc., has named **M. E. Miller** as president and **Jay Rigdon,** vice-president.

Whirlpool Corporation's St. Joseph Div. has announced the appointment of **George Gowen** as director of manufacturing. He succeeds Ralph Ashley.

Friedrich Refrigerators Inc. has elected **Lawrence C. Whitsit** a director. Whitsit is the company's works manager and is responsible for their manufacturing operations. Prior to joining Friedrich, in 1957, he was assistant works manager at the Detroit plant of Nash Kelvinator.

Artisan Metal Works Co., Cleveland, Ohio, announces the election of **Donald A. MacRitchie,** former vice president and general manager, to the office of president of the firm. Artisan is a producer of metal cabinetry and precision electronic gear chassis and enclosures.

Unitary Equipment Div. of Carrier Corp. has appointed **Frank E. Purcell** as sales manager of packaged equipment. The announcement was made by Russell Gray, vice president and general manager of the division.

Minneapolis-Honeywell Regulator Co. has announced the election of **Fred Maytag II** as a director. His election increases the membership on Honeywell's board of directors to 12.

Fairmont Aluminum Co. has designated **Robert P. Maloney** as district manager of Fairmont's Pittsburgh, Pa. sales office, which serves the company's customers throughout the western two-thirds of Pennsylvania.

White-Rodgers Company has created a new Product Planning Division to guide management in future product growth, according to a recent announcement by R. A. Sherer, vice-president of sales.

Robert N. Weber has been appointed to head the new operation. Weber was formerly manager of the St. Louis Sales Region for the company.

Metal and Thermit Corp., Rahway, New Jersey, has announced the divisionalization of organic coatings operations. This newly integrated Coatings Division will have complete responsibility for manufacturing, sales, research and merchandising of the entire organic coatings product line under the direction of **Donald W. Oakley,** general manager.

WEBER

OAKLEY

Youngstown Sheet & Tube Co. has promoted **Clarence E. Short** to Minneapolis district sales manager. M. H. Watkins, vice-president of sales, announced the appointment of the former assistant district sales manager of the Minneapolis area. Short succeeds Charles S. Hogen, who has retired.

St. Charles Mfg. Co., St. Charles, Ill., has named **Robert O. Geddes** as manager of residential kitchen sales, according to R. F. Ekman, vice-president in charge of sales. Geddes has been with St. Charles Kitchens seven years, and has been assistant sales manager since December, 1957.

Bohn Aluminum and Brass Corp. has announced several important ad-

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WHITSIT

MAC RITCHIE

PURCELL

Vinyl on steel

→ *from Page 75*

coated steels. The key property which enables press brake forming and deep drawing is a ductile adhesive that retains its bond strength after distortion. It must maintain bond strength under a variety of service conditions involving temperature changes and severe humidity conditions. According to U. S. Steel spokesmen, good adhesion is maintained after the vinyl-coated steel has been elongated 30 per cent and then subjected to any one of the following tests: 1. Immersion in tap water at 80° F. for 240 hours, 2. Exposure to 100 per cent relative humidity at 100° F. for 200 hours, and 3. Exposure in a dry oven at 200° F. for seven days.

Indirect welding used

Several types of indirect welding are possible on this material. The welding techniques commonly in use are: 1. The Graham stud weld, 2. The projection weld, capacitor discharge method, 3. The spring-loaded electrode weld method and, 4. The magnetic force method. The time, energy, and pressure must be controlled to effect a weld without damage to the vinyl. Since the vinyl itself is an insulator, current flow must be controlled from the backside of the sheet. The development of high-production, automated, multiple, indirect welding equipment is not yet complete, and certain definite problems are apparent in applications of this product.

Typical prices

Vinyl-coated steel is sold on a square foot basis, and the price variations depend mainly on steel gage and on quantity. A typical price, given as an example by U. S. Steel, for .010 inch of vinyl on an 18-gage drawing quality sheet in quantities of 20,000 square feet of a single color, would be 35 cents per square foot or approximately 2½ times the price of steel alone. The same vinyl on a 24-gage sheet would be priced at about 24 cents, and on a 28-gage sheet the price would drop to 20 cents.

Abrasion and wear resistance

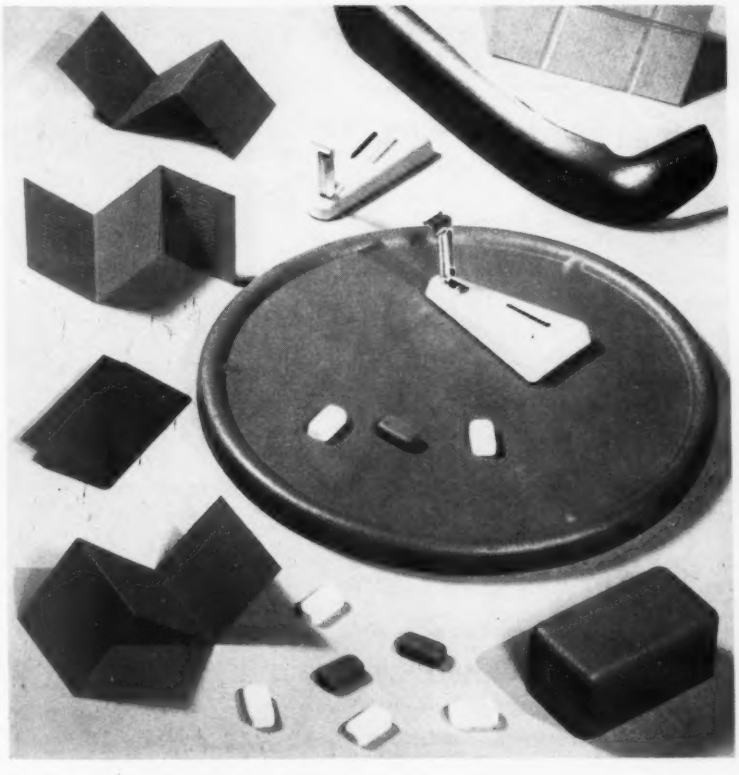
Durability of the vinyl-coated steel is similar to that of the laminated type, according to the U.S.S. report. A number of tests show that scratch resistance and abrasion resistance are high enough to enable vinyl-coated steel to be seriously considered when a selection of materials is to be made.

Process in brief

The process by which the sheet is made is as follows:

1. Cold rolled or galvanized sheet in coils are fed into a cleaning unit where all traces of foreign material are removed.
2. The strip then proceeds into an electrochemical treating unit where a slight etching of the surface occurs and a slight chemical deposit is made.
3. A thin film of thermosetting adhesive is applied to the sheet with rollers.
4. The strip then passes over another roll coater where a suitable primer material is applied to the reverse side of the sheet for corrosion protection, if specified.
5. The adhesive and the reverse surface protection are simultaneously cured in an oven.
6. The liquid vinyl is then applied by a reverse roller coater, and is heat cured on the steel to produce a permanent bond.
7. While still hot, the steel strip passes through embossing rolls where the texture is impressed in the vinyl. After cooling, the product is either coiled or cut to length.

Versatility of vinyl-coated steel is shown by a wide variety of parts. They range from flat work to deep drawing, such as the box in right foreground of photo, and are well within the workability range of the new steel.



Controls Co. Predicts Record '59 Sales

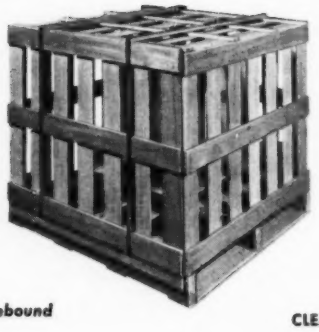
A record-breaking sales volume during 1959 for the Controls Co. of America, Schiller Park, Ill., was predicted by Louis Putze, president, during the company's first corporate wide sales meeting held in late February.

According to Charles M. Stainton, vice-president and director of marketing, an important key to a larger anticipated sales volume will be the introduction of a number of new products. "Present indications show that new products alone will contribute as much, if not more, to the success of the company in 1959 as they did in 1958. We plan to invest in engineering and research at the rate of $1,500,000 on a consolidated basis for the development of new and existing products."

R & M Buys Three Buildings

Three integrated buildings in Springfield, Ohio have been purchased by Robbins & Myers, Inc. According to A. W. McGregor, president, the purchase was directed by the rapid growth of the Springfield operation.

The newly-acquired facilities will house the sales, engineering and manufacturing operations of two R & M divisions-Propellair Industrial Fan and Moyno Pump, both of which are presently located in the main Springfield plant.

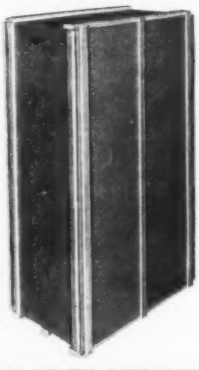


PALLET BOXES — *Hinged Corner*

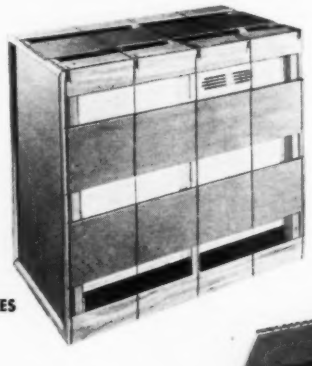
PALLET BOXES — *Wirebound*

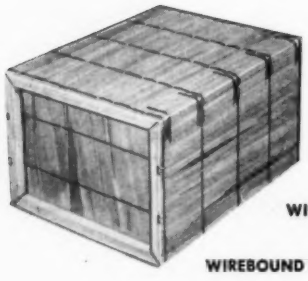
CLEATED BOXES

We make 'em all



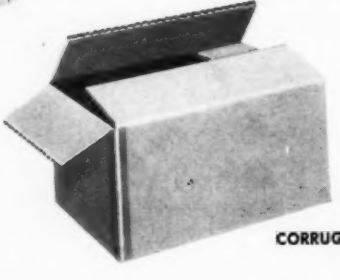
E-Z PAK CLEATED CORRUGATED
(Watkins Type)





WIREBOUND CRATES

WIREBOUND BOXES



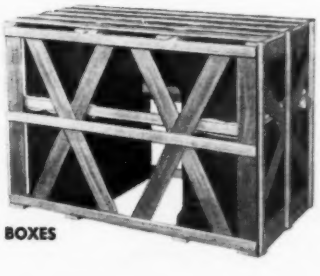
CORRUGATED

you can be sure . . . .

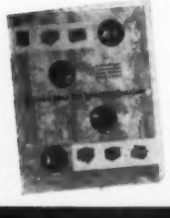
that recommendations from Chicago Mill are based on impartial, unbiased decisions because we manufacture the most diversified line of shipping containers in the country!

Materials used include—

Plywood • Craveneer • Corrugated • Veneer • Resawed



HINGED CORNER CRATES OR BOXES



FREE! *Illustrated catalog showing the various types and applications of Chicago Mill containers, Chicago Mill's services.*

CHICAGO MILL AND LUMBER COMPANY

33 South Clark Street — Chicago 3, Illinois

PLANTS

- CHICAGO, ILLINOIS
- GREENVILLE, MISSISSIPPI
- HELENA, ARKANSAS
- ROCKMART, GEORGIA
- TALLULAH, LOUISIANA

safe transit

editorial voice of the national safe transit program

devoted to improving packaging methods and shipping and materials handling methods for the appliance and metal products manufacturing industries. This section contains plant experience information and industry advances for the use of all executives and plant men interested in improving packaging and shipping methods and in loss prevention. The section contains complete information on the national safe transit pre-shipment testing program for packaged finished products and detailed reports of divisions and sub-committees of the National Safe Transit Committee.

New Firm to Specialize in Idea and Innovation Research

The firm of Carney Associates has been established at 28 E. Jackson Blvd., Chicago, by C. J. Carney, Jr., former managing director of the Society of Packaging and Handling Engineers.

Carney said that his new firm will serve as "creative action consultants" and special project managers, particularly for manufacturers of packaging and materials handling equipment. The company will specialize in idea and innovation research, marketing, and sales management.

Moody Named MHI Exposition Head

Robert F. Moody has been appointed 1959 chairman of the Expositions Committee of the Materials Handling Institute, Inc. The new chairman, who also serves as second vice-president of MHI, will be responsible for the general planning and supervision of the Institute's Material Handling Exposition of 1959, to be held in the Cleveland Auditorium, Cleveland, Ohio, June 9-12.

Compression Tester Designed for Package Testing

A new compression testing machine specifically designed for testing shipping containers, packages, and packaging material has been announced by L. A. B. Corp. The firm states that the relatively-low cost of the machine, as well as its size and capacities, is said to make it suited for use in the container industry. The unit is said to meet ASTM specifications for compression testing.

The tester consists of a fixed platform on which packages are placed, an upper platen connected to a crossbeam which is raised and lowered by two loading screws housed in vertical channels, and a direct-reading dynamometer.

For complete details on the testing machine, write J. T. Hubbard, sales manager, L. A. B. Corp., Skaneateles 1005, N. Y.

Telescoping Railing for Ease in Loading and Unloading

The problem of how to load and unload with railing as a barrier is solved. Slip-on fittings for pipe railing allows one pipe to telescope into another, clearing the way without a gate which may damage merchandise. The pipe is cut to length, clipped into fittings, and fastened securely by recessed set screws using a small hex wrench. The smaller diameter pipe is held closed by a thumb screw. Base fittings are fastened to the floor by wood screws. The idea was developed by Hollaender Mfg. Co.

National Packaging Exposition Set For Chicago, April 13-17

Nearly 400 producers of packages and packaging components will occupy close to four acres of floor space at the American Management Association's 28th National Packaging Exposition and Conference in Chicago, April 13-17. The latest trends in machines and equipment, materials, supplies, methods, and services for packaging will be on view.

A panel of corporation presidents will discuss the expanded dimensions of packaging in industry at a conference in the Palmer House hotel April 13-15. Packaging specialists will then follow up with descriptions of new techniques designed to improve package design, utility, manufacturing, and handling.

Fork Truck Attachment Stacks, Transports, Dumps

A versatile fork truck attachment that stacks, transports, and dumps barrels and drums is offered by Lewis-Shepard Products, Inc. All of the operations—clamping, rotating, lowering, and lifting—are controlled by the operator from his driving position.

The attachment not only handles wooden barrels and steel or fibre drums through clamping pressure, but also dumps their contents by hydraulic tilting action. The objects handled can vary from 18" to 26" in diameter, and be tilted up to 180 degrees forward for dumping. Capacity is 1,000 pounds.

All manufacturing, engineering, and quality efforts are in vain if the product reaches its destination in a damaged condition.

Shipping auto radiators and residential air conditioners in dunnage free cars

FEDDERS-QUIGAN CORP., Buffalo, N. Y., manufacturers of radiators for Chrysler Corp. cars, eliminated dunnage expense while simultaneously cutting damage in rail shipping during a two-year experimentation just completed.

Before the test, in-transit damage to radiators ran high. Shipment to the West Coast Chrysler plant from the Fedders-Quigan Buffalo plant required as much as $150 in dunnage and labor per boxcar.

In-transit damage to radiators in boxcar shipment resulted from loosening of dunnage.

Previously, Fedders-Quigan had experimented with various means of blocking and bracing radiators in freight cars. Results were the same: more damage, more dunnage, more expense all around.

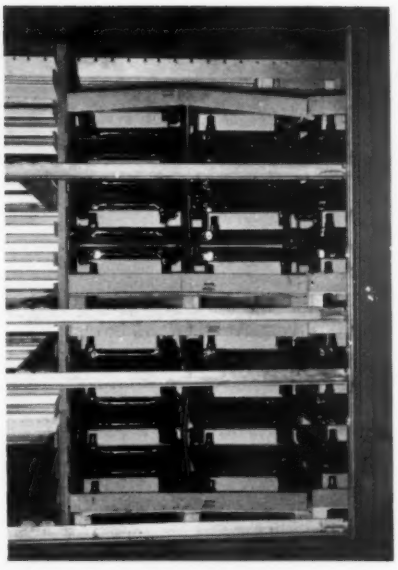
Damon Witte, Buffalo division traffic manager of the firm, heard about a boxcar equipped with load-locking devices to eliminate dunnage. He got in touch with the railroad, asked for dunnage free cars for shipment of radiators from Buffalo to the West Coast. For the next two years, he sent radiators via DF to the coast, to five Chrysler plants at Detroit, and to one at Evansville, Ind.

"Our radiators went through without a dent," Witte reports. "We completely eliminated damage with DF."

During this two-year test period, the firm has worked out two basic methods of packaging and loading radiators. Cars loaded by the first method weigh up to 32,000 pounds. This method consists of placing two radiators, with a corrugated separator between them, in a corrugated container. When loading, crews divide the car into three sections, using twelve 48-inch decks, 24 crossmembers, and eight doorway bars.

Cars loaded by the second method, with radiators uncartoned on pallets, have a total weight of approximately 30,000 pounds. This method consists of vertically stacking radiators face down, then capping the stack with corrugated material and steel-strapping the entire unit to a pallet. Forty-four such pallet loads are placed in each car.

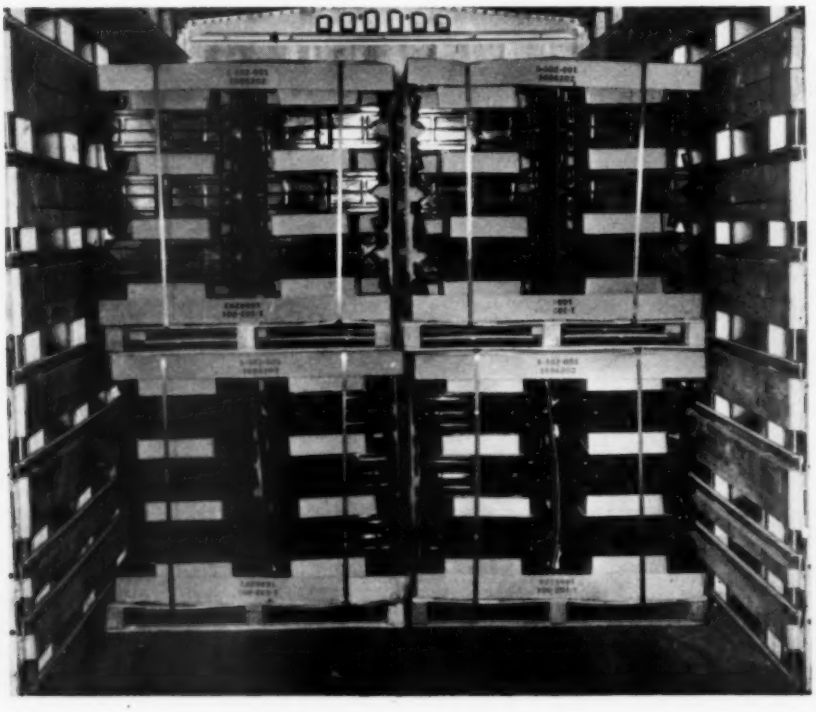
Fedders-Quigan also manufactures residential air conditioners in its Buffalo plant. Dunnage free cars are now going into service on carload shipments of these air conditioners.

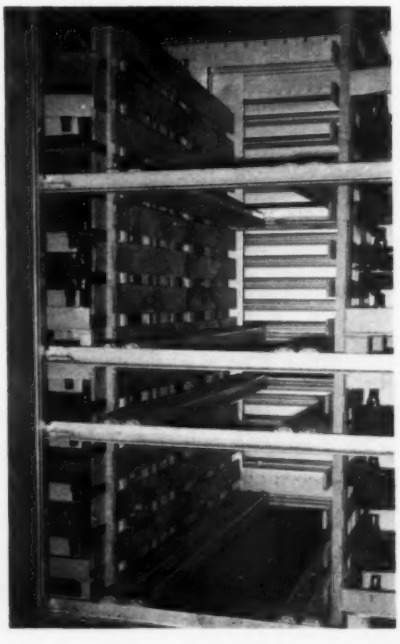


(Above) — Removable doorway belt rails permit loading of radiators in boxcar doorway area.

(Lower left) — Looking down the partially-loaded boxcar. Portable bulkheads will be placed against this section of Fedders-Quigan car radiators, then loaded in place by car-width, retractable-tipped crossmembers. Crossmember ends lock into permanently-installed perforated belt rails along car walls, left and right.

(Lower right) — Radiators faced with bulkheads and locked with car-width crossmembers. Removable belt rails across boxcar doorway allow bulkhead and crossmember securing of the load in the doorway itself.





Personals

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vancements of officers of the company. The advancements are: **Simon D. Den Uyl,** elected chairman of the board; **Terry W. Kuhn,** elected president; **Richard C. Aylward,** elected vice president-sales; **H. Blake Thomas,** general manager of Betz Div., elected vice president; and **Guy H. Pitts,** elected director.

Detroit Controls Div., American Standard Corp., has completed realignment of their top management team with the appointment of **John R. Warnock** as general manager of marketing. The announcement was made by F. J. Kreissl, division president.

Warnock has been with Detroit Controls since 1936, holding positions of increasing responsibility during this tenure. He most recently has been Detroit district sales manager of the corporation's plumbing and heating division.

Admiral Corp. has announced four new executive appointments. Two of these involve Midwest Mfg. Corp. and Canadian Admiral Corp., Ltd., subsidiaries of Admiral.

Vincent Barreca was named executive vice president, succeeding John B. Huarisa, who had resigned, and **Thomas J. Lloyd** was named vice president-government electronics at Admiral.

L. H. Moos was appointed president of Midwest Mfg., and **Stuart D. Brownlee** was named president of Canadian Admiral.

Reynolds Aluminum Service Corp. has announced the appointment of **Sid W. Jagger** as executive assistant. He will assume his post in Reynolds Washington office immediately on termination of his duties as assistant commissioner for operations of the Urban Renewal Administration, Housing and Home Finance Agency.

Universal-Cyclops Steel Corp., Bridgeville, Pa., has announced the appointment of **Fred A. Kaufman** to the position of vice president and general manager. In this newly-created post, he will have responsibility for the direction of sales activities and the operation of the company's plants at Bridgeville and Titusville, Pa., and Coshocton, Ohio. Previously, Kaufman was vice president in charge of its Refractomat Division.

48-inch pattern sheet has good potential in appliance industry

rolled-in pattern on steel is available as commercial or drawing quality

THE development of a new sheet steel product that can be given a variety of rolled-in patterns, among them one which has the appearance of fine-grain leather, has been announced.

The leather-patterned sheet, developed by Pittsburgh Steel for Westinghouse Electric Corporation, forms the outside shell, or "wrapper" on a custom furniture-styled line of Westinghouse Laundromat automatic washers and electric dryers.

Styled to conform with Westinghouse's Shape of Tomorrow theme, the L-1000 Laundromat and the D-1000 electric dryer were introduced nationally in February. Dealer and customer acceptance of the new line is said to have been enthusiastic.

Officials of Westinghouse's Mansfield, Ohio, appliance manufacturing center began working with the steel producer nearly a year ago to develop the newly designed product. It is stated that this is the steel industry's first production of pattern-designed flat-rolled steel in widths up to 48-inches — about twice the width previously available.

A promising future is predicted for wide-width patterned sheets, especially in appliance, automotive and building industry applications. Patterned sheets are suitable for any application where decorative appeal is needed. Several purely functional applications also are under test. Available as commercial or drawing quality, pattern sheet can be supplied in a variety of gauges and widths, and as either cut lengths or coils.

Westinghouse gets its patterned sheets in cut lengths and then puts the sheet through all the regular fabricating steps required to form the sturdy shells of Laundromats and dryers. Pattern-rolled can be run interchangeably through all Westinghouse's production sequences without any special or additional setups or changes. Once formed, the shell is phosphatized and then sprayed with a smooth coat of soft wood-toned enamel. This helps emphasize the pattern and imparts the pleasing, but subdued, leather-like effect.

Technically, there is said to be no limit to the type of pattern which can be applied to this sheet. Any pattern which can be drawn on paper can be impressed into the steel. The pattern becomes part of the metal and the design is limited only by the severity of the draw. Further information can be secured by writing Dept MPM, Pittsburgh Steel Co., Grant Bldg., Pittsburgh.

Presstime News

Wedgewood-Holly Under New Management

The assets of Wedgewood-Holly Corp., Culver City, Calif., a Rheem Mfg. Co. subsidiary, have been sold to companies organized by Henry Honer, former president of Wedgewood-Holly. The announcement was made jointly by A. Lightfoot Walker, Rheem president, and Honer.

The new companies will continue the manufacture, sale, and service of built-in and free-standing gas kitchen ranges under the Wedgewood-Holly name.

Charcoal Grill Manufacturers

The board of directors of the Charcoal and Grill Manufacturers Association has announced an industry-wide program designed to broaden markets for charcoal grill equipment. Cooperation has been developed between manufacturers of charcoal grills and barbe-

COMING FEATURES

DESIGN

THE ROLE OF THERMOSTATS IN APPLIANCE DESIGN

THREE ENGINEERING DESIGNS FOR AUTOMATIC MERCHANDISING MACHINES

FABRICATION

WATER HEATER TANK LINE FEATURES AUTOMATIC WELDING

FINISHING

FINISHING LINE DESIGNED FOR TWO-MAN OPERATION

NEW PLANT DESIGN FOR PORCELAIN ENAMEL ON ALUMINUM

GENERAL

• SPECIAL SECTION — AUTOMATIC MERCHANDISING MACHINE INDUSTRY

POLISHING WITH POWER BRUSHING

CLASSIFIED

Per column inch: 1 ti. 3 ti. 6 ti.
1 to 2" inclusive $18.00 $17.00 $16.00
3 to 5" inclusive 17.00 16.00 15.00
6 to 9" inclusive 16.00 15.00 14.00
Measured in vertical column inches; each column 2¼" wide. Accepted in column-inch multiples only. For reverse plate, add 25 per cent. No agency commission.

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If you are creative, and an innovator, with product design and development experience, you will want to investigate this opportunity.

Ours is a young, aggressive company, the leader in a fast-growing industry. Products of mechanical design and consumer appliance category.

Send resumé to Box 4-A, Dana Chase Publications, York St. at Park Ave., Elmhurst, Ill.

cues and their principal suppliers.

The following officers and directors were chosen at elections held in January and February: president, E. Wade Busby, national sales manager, Big Boy Manufacturing Co. Inc.; vice president, L. O. Morin, Jr., executive vice president, Chattanooga Royal Co.; treasurer, Gordon B. Sutton, director of sales, Furniture and Housewares Div., Arvin Industries, Inc. Other directors are: J. D. Brown, president, Poloron Products, Inc.; David Kamenstein, president, Kamkap, Inc.; and W. C. Neumann, general sales manager, Union Steel Products Co.

The first annual meeting of CGMA will be held in conjunction with the IAM national convention and exhibit at the Netherland Hilton Hotel, Cincinnati, on June 1-4.

Canadian Firms Combine

The boards of directors of both companies have approved a proposal for Controls Co. of America, Cooksville, Ont. to acquire the assests of Redmond Electric Motors of Canada Ltd., it was made known by Dan O'Leary, president of Controls Co. Ltd. Both Canadian companies are subsidiaries of Controls Co. of America, which is headquartered at Schiller Park, Ill.

National Welded Products Month

Welding will be featured in programs throughout the nation during April, National Welded Products Month, to dramatize the importance of welding to

to next Page →

ADVERTISERS' INDEX

CUSTOMER SERVICE OFFICES

DANA CHASE, JR., York St. at Park Ave., Elmhurst, Ill. ..... TErrace 4-5280
R. F. KENDIG, York St. at Park Ave., Elmhurst, Ill. ..... TErrace 4-5280
KARL J. SHULL, 608 Midvale, Los Angeles 24, Calif. ..... GRanite 7-8824 and WEbster 1-3030
FRED JAMESON, 821 Edinburgh St., San Mateo, Calif. ..... Diamond 3-8806

the economy of the country and to the American Way of life, according to an announcement by the American Welding Society.

The 40th Annual Convention and Welding Show, April 6-10, will spearhead the month's activities in Chicago. The city will be host to thousands of welding experts, metallurgists, manufacturers and fabricators. The latest equipment and materials will be on view at the International Amphitheatre, and the technological progress of the industry will be told at the technical sessions in the Hotel Sherman.

Westinghouse Announces Plans to Rearrange Appliance Production

Plans to manufacture four additional products at its Columbus plant within the next few months have been announced by Westinghouse Electric Corp. Eventually, this will mean creation of several hundred additional jobs and will help to stabilize employment there.

John W. Craig, Westinghouse vice president and general manager of the Electric Appliance Divisions, announced that the company this summer will begin to transfer to Columbus the production of room air conditioners, dehumidifiers, food-waste disposers and water coolers from the firm's plant at Springfield, Mass. The Massachusetts plant will continue producing the company's motorized small appliances. First production of the items in Columbus is scheduled to start in October.

White-Rodgers Creates New Marketing & Research Div.

White-Rodgers Co. has created a new marketing and research division to provide management with a continuing picture of market potential. Announcement of the new division was made recently by R. A. Sherer, vice president of the St. Louis-based manufacturer of temperature controls.

Sherer also announced the appointment of John H. Martin as manager of the division.

Resin Capacity Increased

Pelron Corp., Lyons, Ill., has just completed the latest step in their expansion program by the installation of the necessary equipment to produce an additional 650,000 lbs of polyurethane resins per month.

Fostoria Pressed Steel Corp. has announced the election of **Richard H. Carter** as president. He will succeed E. L. Bates, who has resigned. Carter was named vice president in 1953, and general manager in 1958.

Zenith Radio Corp., Chicago, has announced the appointment of **Ralph Spang** to the position of comptroller. He was formerly with Hotpoint.

The O. Hommel Co. has announced the appointment of **John L. McLaughlin** as district manager of porcelain enamel frit sales and service in the southern territory. Nashville, Tenn. will eventually be his headquarters.

Packaging Association of Canada, at the association's annual conference, March 10-11, elected **Samuel Chum Torno,** vice president, Danforth Wines Ltd., Toronto, as its president. He succeeds C. W. Stephens, recently retired vice president and general manager of Dominion Paper Box Co., Ltd., Toronto.

Landers, Frary & Clark's Bret C. Neece announced the appointment of **Charles O. Dahl** to the position of general manager of the Landers of Arkansas division of the company. The division produces electric housewares products.

Dahl formerly was vice president of manufacturing for National Presto Industries, Eau Claire, Wis.

METAL PRODUCTS STATISTICS

a current report on available production, shipment and sales figures for important products in the appliance and fabricated metal products manufacturing field

		1959 (Units)	1958 (Units)	% Change
Gas Water Heaters	January	254,300	234,400	+ 8.0
Gas Ranges, Built-In	January	20,300	13,000	+56.2
Gas Ranges, Free-Standing	January	128,300	115,400	+11.2
Gas Furnaces	January	63,300	47,700	+32.7
Gas Fired Boilers	January	5,700	5,600	+ 1.8
Gas Conversion Burners	January	6,800	7,400	- 8.1
Electric Refrigerators	January	256,200	206,100	+24.3
Electric Freezers	January	78,800	63,000	+25.0
Electric Ranges, Free-Standing	January	79,200	78,800	+ 0.5
Electric Ranges, Built-In	January	41,600	30,200	+38.0
Electric Storage Water Heaters	January	62,800	61,700	+17.8
Electric Dishwashers	January	37,900	30,400	+24.6
Electric Food Waste Disposers	January	48,500	40,800	+17.8
Combination Washer-Dryer	January	16,922	13,442	+26.0
Washers, Automatic & Semi	January	223,893	189,601	+18.0
Washers, Wringer & Others	January	64,598	55,239	+17.0
Electric Dryers	January	78,593	70,475	+12.0
Gas Dryers	January	39,627	30,318	+31.0
Vacuum Cleaners	January	242,516	265,489	- 8.7
Metal Furniture	January	*	*	+ 6.0

		1958	1957	
†Television	December	559,047	770,788	-27.5
	Jan.-Dec.	5,061,851	6,285,819	-19.6
†Radio	Jan.-Dec.	8,738,197	9,575,812	- 8.8
Compressor Bodies	November	239,576	202,323	+18.4
	Jan.-Nov.	3,280,823	3,738,686	-12.2
Steel Barrels & Drums	December	2,663,864	2,399,333	+11.0
	Jan.-Dec.	31,643,379	35,701,323	-11.4
Steel Pails	December	5,123,083	4,442,810	+15.4
	Jan.-Dec.	72,413,137	73,678,085	- 1.7
Typewriters	December	109,730	*	*
	Jan.-Dec.	1,233,313	*	*

* Not Reported
† Output

Sources for this information: Gas Appliance Manufacturers Association, National Electrical Manufacturers Association, American Home Laundry Manufacturers Association, Vacuum Cleaner Manufacturers Association, National Association of Furniture Manufacturers, Electronic Industries Association, Air-Conditioning and Refrigeration Institute, and U.S. Dept. of Commerce.

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.....when you design a new appliance

or restyle an old one

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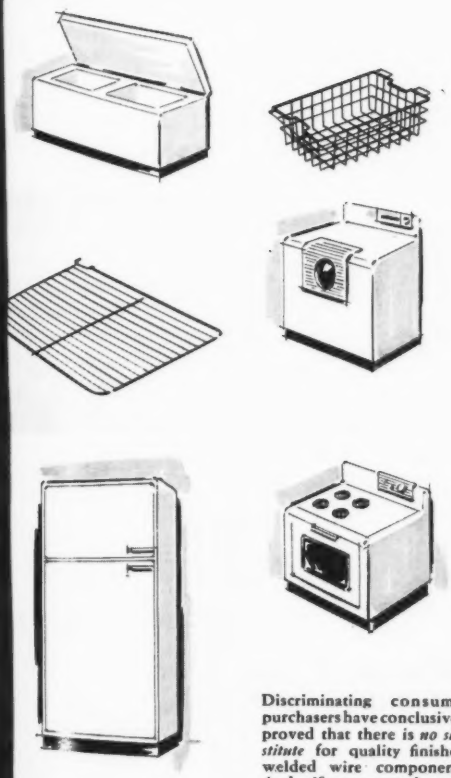
Why not make your manufacturing dollar go further? *Keep the USP man in mind.* He will survey your problem and provide a sound, economical solution—without obligation.



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For Appliance and Related Applications

Here is the present line of Tuttle products designed to help you manufacture better electrical products. New in the group are the single position infinite control and the tubular heating element. The Single Position Infinite Control was formerly manufactured and sold by Tuttle & Kift, Inc., and we are pleased to announce our acquisition of the manufacturing and sales rights to this highly efficient control. The Tubular Heating Element was recently designed by us for use in hand dryers. It has many other possible uses. We would welcome the opportunity of working with you on any of your problems involving any one or more of these, or other electrical products. Merely call or write.

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The N-14 Control enables a heating unit to deliver all or any portion of its heating capacity. Proportioning of heating capacity is accomplished by a pre-setting of the control knob, thereby controlling the time of contact dwell. Furnished in various time cycles depending upon your requirements, i.e., from 4 R.P.M. to ½ R.P.M. cycle motors.

2 TOGGLE SWITCHES

The unusual simplicity of the new TEP Toggle Switch design achieved by Tuttle Research Engineers, now provides a dependable, top-quality switch at lower cost. Considerably smaller than comparative switches offering the same variety of contacts, it includes provisions for four-way wiring connections. There are only 11 working parts, and the complete switch weighs less than one ounce.

3 HEAT SELECTOR SWITCHES

Series 3000 rotary snap-type switches, also manufactured by TEP for electric ranges, air conditioners, space heaters and related applications, feature positive, trouble-free contact action and 7-heat selection. They are available either with or without a pilot light and with different shafts and handles to suit your needs. Write today for sample and quotation.

4 TUBULAR HEATING ELEMENT

This element is ideal for a wide range of applications. It's highly efficient in heat guns, hair dryers, space heaters, hot food vendors, photo print dryers, and other products where air is to be heated while flowing through a tube or nozzle. It can be controlled thermostatically and furnished in ratings from 500 to 2000 watts at 115 or 220 volts.

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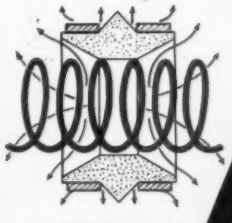

PATENT PENDING

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